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The growth of the green bond market: A qualitative analysis of the barriers and opportunities

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Abstract

Despite the growing importance of green finance, green bonds currently account for less than 3% of the global bond-issue. As such, this paper aims to provide insights into the current status of the green bond market and its growth, focusing on the growth barriers and positive impacts of green bonds. This thesis is based on the literature available and on qualitative research in the form of in-depth interviews with a sample of eight experts in the field of green bonds. It concludes that current barriers can be solved, and that green bonds will become a significant part of the total bond market.

Key words: Green bonds, growth barriers, positive impacts, expert interviews

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1. Introduction

With the introduction of the Paris Agreement, the Sustainable Development Goals (SGD) as well as the EU action plan on sustainable finance the need for green investments urged, since there was a huge investment gap, currently estimated at €180 billion per year (European Comission, 2019) in order to be able to fulfil those commitments (Climate Bonds Initiative, 2015). Green bonds are financial products from the field of sustainable finance (Paranque & Pérez, 2016). There are many definitions of green bonds, but there is still no general consensus when it comes to defining green bonds as a financial instrument. The definition underlying this study is: a "green bond", is a fixed-income debt instrument that raises funds from investors willing to invest in projects that benefit the environment (ICMA, 2018). Their financial structure is the same as of conventional bonds – face value, yield, risk, maturity date and issuer. Green bonds differ from regular bonds in that they are a type of thematic bond. Their "green" label obliges the issuer to use the proceeds of the bond to finance or re-finance climate-sensitive projects and thus to support the development of a low-carbon and climate-resilient economy. Furthermore, green bonds are used to finance green assets and projects rather than green entities (Gianfrate & Peri, 2019).

The issuance of green bonds has experienced considerable growth over the last ten years, from both developing and industrialised countries, as well as from corporate to sovereign green bonds (Climate Bonds Initiative, 2019). Moreover, the positive aspects of green bonds for our society and environment are presented by various studies. However, it is a fact that the green bond market still accounts for less than 3% of the total bond market (Climate Bonds Initiative, 2019). Hence, a few questions arise; are there any growth barriers that hinder the green bond market to exploit its full potential? Which opportunities does the green bond market bring with it? Will the demand keep growing? And what are the implications for its future? The reasons behind the low presence of green bonds compared to the global bond issuance is still not extensively explored by the literature. Therefore, this paper aims to provide insights into the current status of the green bond market and its growth. It contributes to the strand of literature, which focusses on growth barriers and positive impacts of green bonds. Additionally, this paper's contribution lies in the use of qualitative research in the form of expert interviews. This allowed to question the status quo of the literature and to extend it with professional experience and insider knowledge of experts, that cannot be found elsewhere.

The present work begins by displaying the theoretical background that is relevant for the understanding of this topic. Accordingly, a literature review is conducted to identify growth barriers that are currently hampering the acceleration of the green bond market, as well as to elaborate on the positive impacts identified by current literature that are in favour of further growth. The following chapter explains the methodology behind the qualitative research method with eight semi-strcutured in-depth interviews. Next, the main findings from the expert interviews will be presented. Subsequently, the findings are discussed and compared with current literature, as well as expatiated on its contribution to the subject matter of this thesis. Finally, the findings of this work are summarized as well as its limitations, and suggestions for further research are presented.

2. Literature review

This section is intended to give an overview of the green bond market and its development so far, as well as the current state of research on its growth barriers and positive impacts.

2.1 The Green Bond Market

Green bonds can be issued by various parties. Depending on who the issuer of the green bond is, one can distinguish between different types of bonds (Shishlov, Morel, & Cochran, 2016). According to the OECD report (2017), green bonds can be divided into seven different types (Table 1). The most issued green bonds are green financial sector bonds, corporate and sovereign bonds (Climate Bonds Initiative, 2019).

Type	Annotation
Green coporate bond	A "use of proceeds" bond issued by a corporate entity with recourse to the issuer in the case of default on interest payments or on return of principal.
Green sovereign bond	A bond issued by a national government entity, with the purpose of funding of enviromental friendly projects.
Green financial sector bond	A type of corporate bond issued by a financial institution to specifically raise capital to finance "on-balance sheet lending" (i.e. to provide loans) to green activities (e.g. ABN AMRO or Agricultural Bank of China).
Green project bond	A bond backed by single or multiple projects for which the investor has direct exposure to the risk of the project, with or without recourse to the bond issuer.
Green asset-backed security	A bond collateralised by one or more specific projects, usually providing recourse only to the assets, except in the case of covered bonds. For covered bonds, the primary recourse is to the issuing entity, with secondary recourse to an underlying cover pool of assets, in the event of default of the issuer.
Green suprantional bond	Bonds issued by international financial institutions (IFIs) such as the World Bank and the European Investment Bank (i.e. "supranational issuers").
Green municipal bond	Bonds issued by a municipal government, region or city.

Table 1: Types of green bonds (OECD, 2017)

Another way to distinguish between bond types is to look at whether they are labelled or not. A labelled bond has been labelled green by the issuer or additionally is certified as green by an external third party (ICMA, 2018). Unlabelled bonds, on the other hand, "*are conventional bonds from corporates whose businesses are naturally aligned with environmental projects*" (Preclaw & Bakshi, 2015). According to a report by the United Nations Environment Programme (2016) there is still a shortage of labelled and certified green bonds in the market, which could partly be explained by the high certification costs and associated mandatory reporting costs for the issuer.

Furthermore, a distinction can be made between institutional and retail investors in green bonds. Retail investors are private and small investors, while funds, insurance companies and pension funds are institutional investors. They differ above all in their maturity preference and the amount of their investment (Böhlen & Kan, 2008).

Green Bonds have experienced a dynamic development over the past ten years. Although the first green bond was issued in 2007 by the World Bank and the European Investment Bank (United Nations Development Programme, 2017), the most rapid growth in the green bond market started after the Paris Agreement in 2015. This Agreement includes a global action plan to limit global warming where countries agreed to become carbon neutral during the second half of the century and recognises the need to direct financial flows towards low-carbon and climate-resilient development.

The issuance of green bonds has steadily been increasing and reached a height of 167.7 billion US dollars in 2018. Furthermore, forecasts for 2019 already predict a volume of new green bonds of between 250 and 300 billion US dollars and for 2020 of up to one trillion US dollars. The top three issuers have been: Fannie Mae, the American mortgage bank with 20.1 billion US dollars, the Chinese Industrial Bank with 9.6 US dollars, and the Republic of France with 6 billion US dollars (Climate Bonds Initiative, 2019). Market growth has consistently exceeded investors' expectations, who initially doubted the prospect of a market that would offer investors no additional benefits beyond environmental friendliness (Bachelet, Becchetti, & Manfredonia, 2019).

The main growth drivers were the nationally determined contributions, as well as the increased demand in the market and the resulting pressure from society for corporations to incorporate environmentally friendly measures into their corporate strategy (Tolliver, Keeley, & Managi, 2019). In addition, De La Gorce (2019) states green bond issuance of financial institution as another key growth factor.

2.2 Growth Barriers and Challenges for Green Bonds

More and more institutional investors are decarbonising their portfolios and redirecting funds towards environmentally-friendly investments because they regard climate change as a growing threat to long-term economic growth (Ceci, 2015; Tang & Zhang, 2018). However, despite this promising outlook, demand for green bonds is currently outstripping supply (Wisniewski & Zielinski, 2019) and the size of the market is very small compared to the conventional bond market (Climate Bonds Initiative, 2019). The following passage will examine the challenges that the green bond market is currently facing that hamper its growth.

2.2.1 Authenticity barriers

The Green Bond Principles (GBP) are voluntary process guidelines, created by the International Capital Market Association (ICMA) in 2014, which encourage issuers to be transparent in order to promote integrity in the further development of the green bond market (ICMA, 2018). In addition, a technical expert group on sustainable finance set up by the EU Commission in July 2018 published its preliminary draft of what a standard for green bonds could look like (European Comission, 2019). However, legalised and officially recognized green bond identification schemes currently do not exist (Preclaw & Bakshi, 2015).

The absence of a binding definition of what exactly "green" means is a major risk to the development of the green bond market. One of the most frequently mentioned consequences of this is the risk of "greenwashing". Greenwashing means that a project labelled as "green" may not be (Aji & Sutikno, 2015; Lane, 2012). According to the Underwriters Laboratories (2016) greenwashing is defined as: "*The act of misleading consumers regarding the environmental practices of a company or the environmental benefits of a product or a service*". Repsol serves as a good example of doubtful green bond emission. Repsol were the first fossil fuel company to issue green bonds in 2018 to finance energy efficiency and the reduction of CO_2 emissions. Prior to issuing the bond, Repsol received a second certificate from Vigeo Eris verifying that the bond was green. Despite this certification, most major green indices did not list the bond on the stock market. Critics of the Repsol issue argue that the bond is not a fundamental change in Repsol's business model, but only a gradual one (Climate Bonds Initiative, 2017). The difference in the certifiers' assessment underlines the need for the government to establish criteria for qualifying green bonds, since greenwashing entails risks of authenticity as well as of bad reputation for both the investor and the issuer (Mihálovits & Tapaszti, 2018).

Furthermore, the absence of established penalties in case of green defaults, illustrates an aggravation in greenwashing risk. Currently, the credit risk of green bonds consists of the risk of liquidity due to long maturities, the risk of the issuer or project going bankrupt and the risk of payment default. Hence, there is no non-compliance as long as the issuer can meet the payment obligations associated with the bond. In the case of green bonds however, the obligations do not only include payments, but also the need to comply with what the bond proceeds were issued for. However, there are currently no "penalties" if these commitments are not met, in other words in case of green default. Although it is an obvious advantage of green bonds that, unlike conventional bonds, investors know exactly what the purpose of their investment is, and which projects will be financed by the monetary assets, the question of what happens if the company issuing the bond fails to comply with that purpose, however, still remains unanswered. Hence, in the case of a green default, there are no clearly specified consequences, which increases moral hazard (Mihálovits & Tapaszti, 2018).

Moreover, there is the issue of so-called additionality. The question often arises as to whether green bonds result in the development of new projects at all, and whether the underlying projects would have been financed with conventional bonds anyway but are now added a green label to attract more investors. For instance, a study by the Harvard Kennedy School (DuPont, Levitt, & Bilmes, 2015) found that the World Bank disclosed green bonds among projects that they already had decided to fund. In addition, the study refers to the Green Bonds issued by the State of Massachusetts, saying they had already planned to finance their projects independently of the green label of the bond (DuPont et al., 2015).

2.2.2 Financial barriers

Besides the authenticity barriers, the literature also sets out some financial barriers. Critics raise the issue that the fragmentation of standards and labels creates uncertainty for investors and will slow future market growth. In view of the risks described above, third-party verification is of great importance. However, such a verification comes with additional costs for the issuer and thus with a disadvantage compared to the issuance of conventional bonds (Weber & Saravade, 2019). In addition, investors mention the high initial capital required for a green bond investment as a further restriction, as well as additional costs as a result of extra due diligence (United Nations Development Programme, 2017).

Since green bonds as financial instruments are relatively new and still very much in development, there is comparably less data-based evidence regarding their performance, and hence different views are held. According to Bachelet et al. (2019) green bonds have higher yields, lower volatility and are more liquid than conventional bonds. Ehlers and Packer (2017), on the other hand, describe that they found no significant difference in the price development of green and conventional bonds in the secondary market, and that the performance was comparable. Moreover, Zerbib (2019) identified a negative premium on green bonds issued compared to conventional bonds, which provides a discount to the issuer (Harrison & Boulle, 2017).

2.3 Positive Impact and Opportunities of Green Bonds

Besides the barriers described above, several studies have also identified positive aspects that green bonds contain (Shin, Hur, & Kang, 2016; World Bank Group, 2018; Wiśniewski & Zieliński, 2019).

2.3.1 Financial impact

Flammer (2018a) studied corporate green bonds and identified several positive impacts. She states that green bonds are effective, they not only improve companies' environmental performance, but also contribute to their financial performance. According to Flammer (2018b) the emission of green bonds is also associated with a long-term increase in value. The increase in value is measured by the ratio between the market value of a company and the book value of its assets. In addition, green bond issuers can see an improvement in operating performance measured by return on assets compared to a control group of companies that issue conventional bonds that are not green (Flammer, 2018b).

According to a report by the World Bank Group (2018), one of the main benefits for issuers of green bonds is to attract new investors and broaden and diversify their investor base, with long-term and environmentally friendly investors (Flammer, 2018a; Shishlov, Morel, & Cochran, 2016; Wiśniewski & Zieliński, 2019; World Bank, 2015). Moreover, several recent studies describe an oversubscription on the green bond market due to strong investor demand

and comparably less supply (United Nations Environment Programme, 2017; Weber & Saravade, 2019). Therefore, green bonds offer a comparatively easy way to attract investors and increase emission volume, which in turn can lead to lower costs in financing green projects and tasks due to economies of scale (Wiśniewski & Zieliński, 2019; World Bank, 2015).

2.3.2 Strategic impact

According to an article published by the World Bank (2015), the growth of the green bond market is changing the way money is invested, as well as what investors expect from their money. As stated in a previous chapter, there are several international processes, all aimed at increasing green investments. The EU's action plan on sustainable finance and the United Nations Paris Agreement are processes that outline a low carbon future and put pressure on investments to demonstrate their commitment to the outside world. Moreover, green bonds can support the implementation of national climate policies by raising awareness and allocating capital more efficiently, especially with a view to shifting capital into low-carbon and climate-resilient projects (World Bank, 2015). Hence, green investments such as green bonds act as a two-way street meaning that issuers do not only get to uphold a good image (Wiśniewski & Zieliński 2019) but also meet and comply with their ethical duty (Bauwens, 2016; Everett, 2013). This aspect is also supported by the study of Bachelet et al. (2019). They point out that investors are willing to receive a lower yield, in other words sacrifice some return, for the opportunity to act in an environmentally responsible manner (Nilsson, 2009), such as holding green bonds for projects that reduce carbon emission through renewable fuel technologies (Bachelet et al., 2019).

Accordingly, the literature review summarised above suggests that, although there are still some growth barriers in the green bond market, there are also several aspects that are in favour of its long-term relevance and assertiveness in terms of further development.

3. Methodology

The following section will outline the rationale for the qualitative research design used in this thesis and describe the data collection and analysis method.

3.1 Research Design

Since the topic of green bonds is still relatively new, the existing literature is limited. Moreover, the topic belongs to the financial industry and is, therefore, often associated with declarations of confidentiality. For these reasons expert interviews are the best method to access meaningful data in order to answer the questions underlying this work, as they firstly allow the interviewees to remain anonymous and thus to communicate their views comprehensively, and secondly to gain expert knowledge that cannot currently be found in the literature.

The research was carried out by conducting semi-structured in-depth interviews with a guide (Appendix 1) that made it possible to link the interview data to the theory. This format gave the interviewees the opportunity to explain their answers in depth and to express their opinions or thoughts freely, such as the barriers and positive effects of the green bond market that were not identified in the interview guide nor the theory section, but still seemed important to them. Furthermore, this approach helped me to tap into the full potential of information and knowledge of the interviewees, which could advance this thesis´ research (Saunders, Lewis, & Thornhill, 2009).

3.2 Data Collection

In total, eight market participants with extensive experience and knowledge of both conventional and green bond trading were interviewed. Furthermore, the experts deal with green bonds from different perspectives: five of them work in different banks in the field of sustainable finance with the specialization of green bonds; one works in an international rating agency with a focus on sustainable bonds, including green bonds; one is from the European

Stock Exchange and one is self-employed in managing and developing green bonds. All of the respondents have multiple years of experience with green bonds.

The interviews were recorded with the interviewees' consent to transcribe the audio files subsequently (Appendix 2). As an anonymous evaluation of the interview data was guaranteed to the interviewees, they are labelled with the letters A to H, as displayed in Appendix 3. Six interviews took place via telephone and two provided written responses between October 21st and November 6th, 2019. In order to reduce the risk of the respondents deviating from the topic (Saunders et al., 2009), an e-mail with the main content of the interview was sent to them in advance. The same interview guide was used in all interviews.

3.3 Data Analysis

To evaluate the data resulting from the interviews, the coding procedure developed by Strauss and Corbin (1990) was employed. The coding procedure is suitable to compare and conceptualize interviewees' responses (Strauss & Corbin, 1990). The coding runs through two phases. In the first phase, the interviews are run through and specific codes are assigned to the text fragments. These codes identify the main topic for each text section. In the second phase, after the codes have been added to the text sections, they are compared with each other and matching codes are linked to a superordinate category. Not every code falls into a single category hence a code can also belong to different categories. Finally, a number of specific main categories emerge that are suitable for the data analysis and make the interviews more comparable (Bogner, Littig, & Menz, 2014). The coding of the expert interviews differentiated between four main topics: growth barriers; opportunities and advantages of green bonds; tools and regulations in favour of the green bond market, and; future prognosis of the green bond market as displayed in Appendix 4.

4. Findings

In the following section, findings from the interviews are described. Firstly, the growth barriers of the green bond market are outlined followed by opportunities and advantages. Next, tools and regulations in favour of further growth of the green bond market are introduced. Finally, the future prognosis of the interviewees is presented.

4.1 Growth Barriers

The interviewees explained that there are currently still some aspects linked to green bonds that are hindering the growth of the market and the reason why the market is still of such small size. One of these aspects is the additional costs and obligations associated with issuing green bonds. Person C elaborates "*For issuers one of the reasons not to issue a green bond, is around […] not so much the financial cost but the time cost, that comes along in issuing or rather setting up a green bond. So, before they issue their first green bond, issuers often have to set up a green bond framework, they have to set up reporting processes, management structures. They also have to get an external review on the green bond which costs some money and it is also the screening on an ongoing basis. Most investors want to see at least an annual reporting on how their money is being spent and what sort of environmental benefits are being achieved by the projects. So that costs time and some money as well and you need someone to do that reporting and tracking, so that are the implemental cost for the issuer*".

Furthermore, the interviewees pointed out that there are currently no general and binding definitions on the market about what exactly green means, which contains the risks of issuance uncertainty for issuers and the risk of greenwashing. Person A stated "*when you don't have a label that defines what exactly a green bond is, what brown, light green or dark green means, you won't actually have labels that investors can 100% securely use to make decisions*".

In addition, Person B, C and F mentioned the lack of project diversity as well as projects in general that would be appropiate for the issuance of green bonds.

Regarding the financial performance of green bonds, especially in comparison with conventional bonds, the interviewees did not completely agree. While everyone agreed that the credit risk contains the same structure as that of conventional bonds, Person A and D stated that there are no differences in the yield of green and conventional bonds as the structure and pricing of the bonds are the same. Person B, C, E and F, on the other hand, recognized some price advantages for issuers due to lower yields, while Person G and H only identifed lower yields and volatility on the secondary market.

4.2 Opportunities and Advantages

All respondents describe that a change in the mindset of investors has developed in recent years, especially since the introduction of international commitments such as the Paris Agreement. According to Person A "*the aspects of long-term solutions and the need of more sustainable growth, from an investor and citizen perspective has developed into a priority and having this investment purpose leads to a greener market*". Since the change of mindset is not only present for investors but also for the society, Person E and H elaborate that there is also the pressure from shareholders and stakeholders who expect not only environmental social governance reporting, but also enviromentally friendly actions. Therefore, the interviewees state that the issuance of green bonds is conducive for the reputation of companies and governments and enables them to communicate their vision to the investors. Person H points out that "*a green bond is not a standalone issuance but requires issuers to have a sustainability strategy in place and convince the market how its green bond issuance is aligned with its core operations*". Moreover, Person A and F explained that there is still a huge financial gap in order to fulfill the prior mentioned commitments, which is why green bonds represent a major opportunity to overcome, or at least significantly reduce, that gap.

In addition, the interviewees elaborate that, since green bonds are linked to extensive disclosures, the investment comes with an increased transparency advantage for the investors.

In terms of financial advantages, all interviewees pointed out that the emission of green bonds attracts more investors, as well as enables investor diversification.

4.3 Tools and Regulations

The interviewees mentioned several tools that would work in favour of the growth of the green bond market, in other words, that would solve, or at least reduce, the growth barriers previously mentioned. Since the emission of green bonds currently comes with additional cost and time implications, Person B suggested a format such as that applied from the Singeporean monetary authorities "*which is creating a fund which helps funding the costs of green bond issuance, so if you are an issuer you can actually pay for the additional costs by getting money from this fund*", which is aligned with what Person D suggested: "*It would be helpful if policy-makers, regulators or nations provide grants for issuers to pay for second party opinions and impact reporting*".

Furthermore, in order to be able to reduce the costs, Persons A and E stated that it would be beneficial to scale up projects. Person A elaborated "*for example between Spain and Portugal there is a huge discussion regarding energy and an Iberian energy union*", those working together as well issuing together "*could really increase their potential in regard of energy and build some synergy, […] that's the kind of strategy that could wave the critical path and help them to build a market and provide more opportunities for issuers*".

Although Persons A, B and C agreed with tax benefits being helpful to boost the growth of the green bond market, Person A noted that it is also important "*to be careful about the limitations of the European Union to tackle tax issues*", and it is "*something that all member states need to agree on and move together with it*". Although "*incentives are needed […] the measures should be very thoughtful and realistic*". Moreover, Person G suggested that, if there would be "*a higher carbon price and more regulation" […] "there would be more real economy green capex and probably then more green bonds*". In addition, Person H suggested to further expand "*the market to reduce entry barriers for issuers from heavy sectors such as Aviation or Oil & Gas who have a strong ambition to transition their activities and are also working to develop new and efficient technologies. This could be done by defining activities that may fall under the "transition" label*".

Furthermore, all interviewees felt the introduction of binding regulations was essential to avoid any confusion in the emission of green bonds, as well as to eliminate the risk of greenwashing. Persons G and H pointed out that the introduction of a clear definition of "green" such as the EU taxonomy could facilitate the emission of green bonds since it would act as a security cover to issuers. However, Persons A, B, C, D and G agreed that the introduction of binding regulations has to be flexible to changes since the green bond market is constantly evolving as well as being adaptable to different situations on national or regional levels.

4.4 Future Prognosis

Regarding the future growth of green bonds all interviewees agreed that the demand of investors will not only remain high but will also keep growing. Moreover, Persons D, E and H even stated that not only demand but also supply will keep increasing. The experts are optimistic with regards to the tools and regulations currently in development and trust them to gradually resolve the growth barriers and allow green bonds to realize their full potential.

Furthermore, the question as to whether green bonds have the potential to be the conventional bonds of the future received a positive reply by the experts. Person E distinguished between time frames, stating that in around five years from now "*we will see a significant increase in supply and demand as well as a market uniform taxonomy, but still rather separate markets between "green" and "non green", in ten years, yes green* [...] *will rather be the standard and* […] *"non-green" must be labelled as such because they do not meet standards. Green is not labelled because it is a market standard*". Person A pointed out that since climate change is not a topic that concerns society now, but rather a topic that will accompany us for a long time, if not forever, there will not be a distinction between green or conventional bonds in the future since all bonds will be climate related and the bonds that we call green now will be the conventional bonds of the future. In contrast, Person G elaborated that it is currently too soon to make predictions since the future of green bonds is very much dependent on some of the market developments in the upcoming years. Person H on the other hand acknowledged the value that green bonds have added in the mitigation of climate change, as well as creating awareness and getting things rolling in sustainable finance but stressed that although he expects "*increased investment in green assets in the future, there are no future scenarios without fossil fuel in the energy mix by 2050. Thus, not all conventional bonds would become green bonds as money will still be going into those assets*".

5. Discussion

The following part discusses the results in comparison with the literature and analyses its implications for the further growth of green bonds.

Several papers cite greenwashing as one of the most recent obstacles to the growth of the green bond market, referring to the absence of binding regulations with regard to the definition of "green" in their justification (Aji & Sutikno, 2015; Lane, 2012; Mihálovits and Tapaszti, 2018). The interviewees saw the absence of binding regulations as being associated with risk and uncertainty for issuers rather than for investors. Although they agreed that one of the most frequently highlighted risks is that of greenwashing, Persons B, G and H did not consider the risk to be as serious as it is presented. They have confidence that greenwashing does not occur due to the attentiveness of the market and market players. Person H stated that "*in the end the greenwashing risk will emasculate by itself through investor and market reactions*". Furthermore, the experts elaborated on the strong reputational risk that would come with greenwashing, which is why issuers would not take such a risk. This favours the further growth of the market. In addition, Preclaw and Bakshi (2015) clarify that different investors also demand different levels of greenness, making it difficult to talk about greenwashing in general. Some investors prefer slightly green projects while others prefer dark green ones based on different project areas. This is in line with Person B, who emphasizes that different investors have different requirements and greenwashing is therefore, difficult to measure or standardise.

The absence of binding regulations is currently a significant concern in the green bond market (Aji & Sutikno, 2015; Mihálovits & Tapaszti, 2018). However, processes are currently underway to change this, such as the introduction of the EU green bond standards and the EU taxonomy (European Comission, 2019). Although the interviewees elaborate on the relevance of such regulations, they also point out the importance of taking the flexibility of such regulations into account, since different countries have different abilities. Hence too rigid regulations could become a barrier to the green bond market rather than a support mechanism.

In terms of financial performance, the literature is conflicting. According to Bachelet et al. (2019) green bonds have higher yields. However, some studies find no differences (Ehlers & Packer, 2017), whilst others argue that green bonds have lower yields (Harrison and Boulle, 2017). Persons A and D stated that there are no differences to conventional bonds in terms of yields since they have the same financial structure, while Persons E, F and G identify lower yields. Thus, the fear of receiving lower yields could deter investors from investing in green bonds. However, Nilsson (2009) and Bauwens (2016) point out that humans not only consider financial aspects in their investment decisions, but also their personal feelings and emotions. One of the factors that is of great importance to people is the environment and the impact they have on it (Nilsson, 2009). Moreover, Everett (2013) goes as far as to argue that investors get psychological benefits from their social investments by feeling good and empowered in their actions, and the contribution they can make. Hence, green bonds serve as a valuable instrument in fulfilling these altruistic motives and delivering the psychological benefits of positively contributing to the environment (Bachelet et al., 2019). Hence, lower yields or poorer financial performance can not be regarded as a growth barrier for the green bond market. Furthermore, it is important to take into account that comparing green bonds with conventional bonds at a general level is risky, as bonds can come from all sorts of areas, and are exposed to different countries, markets and currencies.

Weber and Saravade (2019) point out that the emission of green bonds comes with additional costs, which all interviewees agreed was a barrier. Furthermore, Persons A and B suggested some ways to avoid this obstacle and to minimize the additional costs for issuers. While person B relied on the help of supporting funds, Persons A and D suggested using the advantages of economies of scale to generate cost advantages. By this, they meant combining similar goals in joint projects of companies or nations, so that one can share the costs linked to the emission, but also the resulting advantages achieved through the projects. These examples illustrate ways to overcome the growth barrier of additional cost. In addition, Gianfrate and Peri (2019) point out that the magnitude of the savings for issuers in terms of lower interests paid, exceeds the costs to getting the green label or rating.

One critical aspect regarding the green bond market is the question of whether it actually results in additional projects. While Person A mentioned that the emission of green bonds enables the financing of projects that benefit society, Person G questioned if green bonds actually lead to additional projects. However, the question arises whether green bonds necessarily have to result in additional projects. The Managing Director and Head of Green Bonds at JP Morgan, Marilyn Ceci (2015) argues that the criterion of additionality must be defined differently. She defines additionality as incentives or markets that enable something that would not otherwise be the case. In this sense, green bonds can offer additionality that differs from traditional definitions (Ceci, 2015). According to Ceci (2015), green bonds broaden the conversation on important environmental issues and bring powerful new allies to the table through capital markets like never before. The interviewees pointed out that the emission of green bonds is beneficial in expanding the investor base, as well as contributing to investor diversification. Attracting new investors (Wiśniewski & Zieliński, 2019) and getting them to think about new issues are aspects that meet the criterion of additionality and, therefore, soften the criticism in light of the additionality issue raised.

Furthermore, acccording to Wiśniewski and Zieliński (2019) one of the biggest benefits of issuing green bonds is the improved reputation it brings to both the issuer and the investor. Awareness of the impact of climate change on the global economy and living standards is growing. As a result, more and more companies and individuals are becoming aware of their responsibility and it has become a social norm to integrate environmentally friendly actions into companies and long-term strategies. Hence, the emission of green bonds sends exactly the right message, especially to socially responsible individuals, thus creating a good reputation for the issuer (Shishlov et al., 2016; Wiśniewski & Zieliński, 2019). The reputational advantage was confirmed by the interviewed experts. They explained that a change in mindset in society and the pressure to behave accordingly, is why the investment in green bonds, as well as their issuance, provides the opportunity to communicate such commitments and strategies. In addition, according to Shin et al. (2016), an environmentally friendly reputation can have spill over effects on employee satisfaction. Employee motivation can be increased by a better working environment and they have a better corporate affiliation if they value the company and its actions. This allows socially responsible acts to influence, both directly and indirectly, how attractive the company is to new employees (Shin et al., 2016). This is another factor that favours the growth of the green bond market.

Furthermore, the interviewees suggested that the current development of regulations and funding support, as well as the scaling up of projects are tools in favour of abating the growth barriers.

Finally, the Climate Bond Initiative (2019) predicts the issuance size of green bonds to grow significantly from 2018 to 2019 and 2020, which was confirmed by the interviewee's responses. All interviewees agreed on the fact that demand will keep increasing and green bonds will become a significant part of the bond market, with some even expressing the potential of green bonds to replace conventional bonds in the future.

The findings suggest that current growth barriers can be overcome by the introduction of regulations and tools, and green bonds represent a significant opportunity for the bond market. Due to their positive impacts, they have a high potential to grow from their current less than 3% share (Climate Bonds Initiative, 2019) to a significantly high percentage of global bond issuance.

6. Limitations and Further Research

Although the present study provides valuable insights into the growth barriers and opportunities of the green bond market, it is limited in several aspects.

Firstly, the fact that green bonds are a relatively new topic brings some limitations with it, since there is comparably little research in this area. Additionally, because of the affiliation to the financial sector it is difficult to find experts who are willing to give interviews about their views and experiences due to the confidentiality agreements to which they are subject. Therefore, when looking for experts, great importance was attached to finding experts from as many different perspectives as possible.

Furthermore, the quality of the interviewees, in terms of professional knowledge was not assessed. However, they were carefully selected for their link to green bonds as well as their expert existence.

Moreover, the interviewed experts were exclusively persons on the issuer or rating side and not on the investor side. For further research it would be interesting to also interview the investor side regarding their incentives and requirements.

Proposals for further investigation from a statistical point of view would be to examine whether there is a difference in the performance of green bonds compared to conventional or brown bonds, as there is still a lack of consistent performance evidence in the current literature.

Finally, future research can extend the results of this study by including transition, social and sustainability bonds.

7. Conclusion

Despite the general observation that green bonds have grown in importance as an instrument in the field of sustainable finance and currently have many proponents (Flammer, 2018b; Gianfrate & Peri, 2019), the green bond market still represents a small percentage of the total bond market (Climate Bonds Initiative, 2019). By undertaking an extensive literature review as well as conducting in-depth expert interviews, this study analysed the obstacles that prevent the further growth of the green bond market and the positive impacts that green bonds offer, in order to identify their potential growth and role in the future.

With regard to current growth barriers the interviewees were in agreement with the literature concerning the additional costs (Weber & Saravade, 2019), the issuance risk due to the lack of binding regulations (Preclaw & Bakshi, 2015) as well as the lack of financial results due to the novelty of the market. However, when it comes to the risk of greenwashing the interviewees believed that current literature has been exaggerating the risk and perceive it as overestimated.

With regard to the positive aspects of green bonds, the interviewees were in agreement with the literature. In addition to the social component of green bonds, from the issuer perspective, the key benefits and opportunities are that green bonds are a way of fulfilling their international commitments, improving their reputation by bowing to external pressures and the ability to communicate their green corporate strategy (Bachelet et al., 2019; Wiśniewski & Zieliński, 2019). Furthermore, the issuance of green bonds attracts more investors and increases investor diversification (World Bank Group, 2018; Wiśniewski & Zieliński 2019). From the investor's perspective, investing in green bonds also brings reputational benefits, greater transparency about where their money is going (Shishlov et al., 2016), as well as allows them to spend money aligned with their values (Bachelet et al., 2019).

The current development of regulations as well as funding support and the scaling up of projects are tools in favour of abating the growth barriers. Although it is not clear if the green bond market has brought additional projects (DuPont et al., 2015), it is clear it has changed the way of thinking in the financial sector and raised awareness (World Bank, 2015).

Finally, although the interviewees suggested that, due to the current evolution of regulations and standards, the next five years will be extremely relevant to make precise predictions about the growth of the green bond market, they are confident that the green bond market will keep growing and become a significant part of the global bond market.

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Appendices

Appendix 1: Interview Guide

Interview Guide

The growth of the green bond market: a qualitative analysis of the barriers and opportunities

General Information

- The interview is planned to take around 30 - 45 minutes
- Ask for permission to record the interview
- Anonymity of the interviewee will be protected, should it be required
- There are no right or wrong answers! I am asking for experiences, opinions
- Explain briefly the topic and focus of the study

Introductory Questions

1. To what extent do you deal with green bonds?
2. The green bond market has grown considerably. Why do you think that's the case?
3. What do you think are the main growth drivers?

Advantages of green bond investment and issuance

4. Regarding Sovereign bonds, what do you think are the main advantages to invest in green bonds? What are the incentives to issue green bonds?
5. Regarding Corporate bonds, what do you think are the main advantages to invest in green bonds? What are the incentives to issue green bonds?
6. And for the investors, what are the advantages?

Growth barriers

7. Are there any negative aspects? Which?
8. Although the green bond market has grown a lot its still a relatively small part of the bond market. What do you think are the main challenges?

Market situation

9. At present, one can find statements in the literature to the effect that the yield of green bonds is higher than that of conventional bonds, while in others it is lower. Which position do you agree with?

10. How would you classify the risk of green bonds? (To answer this question, you can also compare the risk with conventional bonds)

Future outlook

11. Do you believe that mandatory regulations for the issuance of green bonds and the definition of "green" would help the further development of the market?
12. What (Regulation, tax incentive or other tools) do you think must/could be improved in favour of the green bond market long-term?
13. Do you think the risk of green washing can be mitigated in the future? If yes do you have something in mind about how?
14. From an issuer perspective, what needs to be done/changed to increase green bond supply?
15. Currently there is more demand than supply in the green bond market, therefore green bonds are often oversubscribed. Do you think demand will stay as high, grow even more or emasculate?
16. Since I‘m trying to answer the question of whether “Green bonds are just a trending fad or an long-term solution in the mitigation of climate-change”; How do you think does the future of Green bonds look like? Is there a future or wont there be a differentiation between green and conventional bonds five years from now? Do you think that in ten years time all bonds will be green?

Appendix 2: All Interviews Transcribed

2.1 Interview A

Me: To what extent do you deal with green bonds?

A: So basically, I’m working at the Luxembourg Stock exchange, on a regulatory and legal perspective and Im not involved I in the preparation of the frameworks or process of listing of green bonds. Basically, my work here is with the EU regulatory affairs, so I unfold and participate in all the discussion over the recent proposal of the European commission for green finance. To give you some further information, in 2017 I’m sure you know already the European commission launched a huge debate on how they could support the development of green finance and set up a high-level group to work on it to tackle the current issues. We were part of this high-level expert group so since the beginning we are very involved in this discussion. Following up the recommendation from the high-level group the EU commission set up an action plan on green finance and published the EU taxonomy. In the following they set up a technical expert group which was a follow up of the high-level group and we were also invited to join the technical expert group, so to answer your question and I haven't forgot it, I'm very involved in the discussion on green bonds, not just bonds but also green finance and supporting the Euopean commission in how they can further develop green finance.

Me: Thank you very much, it's is very nice that you explained it in such a detailed way, because now that I know all the details I think you a very relevant interview partner because we will later continue to talk about that one of the main barriers is that there are not standard regulations yet. Also, what you told me with the technical group, as far as I researched, they have published a draft but it's voluntary it's not mandatory yet.

A: Exactly! I would like to add that for example to list a bond with us you have to follow two additional layers of requirements. Why do we actually have additionally layers of requirements is due to guarantee and help the investors being informed about the path of their investment and where the money goes. It is important for the market and the actors in the market. We have to assure that issuers are being fair and reporting authentically. So that, Investors can make informed decisions.

Me: The green bond market has grown drastically. Why do you think that's the case?

A: First of all, I need to disagree with the first part of your question which is not actually the case. I don't agree that the green bond market has grown drastically- I agree with the fact that the green bond market has grown- point. Basically, it's overstating here, it's not true that the green bond market has grown drastically, it depends on which timing we are talking about. If we are talking about the last ten years, yes it has grown drastically but if we are talking about the last 1-2 years it has grown but not drastically. It has grown considerably since all the discussions about climate change has started and when international commitments such as the Paris agreement and SDGs were introduced. So, all these discussions globally are actually the perfect scenario to make sure that the green bond market is growing, because everyone agreed that public money is not enough to actually deal with all these environmental topics and more money is needed. Not only from the public sector but also private issuers which should also be involved in this discussion. So, to answer your question I think one of the main triggers was the introduction of those commitments. And the impact of all those catastrophes due to climate change, we should all be aware we are not talking about a theoretical act but rather are confronted with the consequences on a daily basis, which is the key issue to why it's important to have the green bond market grow.

Me: What do you think are the main growth drivers?

You mentioned in the question before the main reason why the green bond market developed in the first place, but to differentiate the this question from the second one- what do you think are main drivers for investors to invest in green rather than for example brown bonds?

A: There is a slow change of mindsets, basically the aspects of long-term solutions and the need of more sustainable growth, from an investor and citizen perspective has developed into a priority and having this investment purpose leads to a greener market. Not just green bonds because also equity and funds are also playing a key role but in general, I think there is now a change in mindset and the awareness about the need to think a little more on investing in sustainable instruments has increased.

Me: Regarding Sovereign bonds, what do you think are the main advantages to invest in green bonds? What are the incentives to issue green bonds?

A: Involving the society and stakeholders into big and fundamental issues is key for me. Regarding sovereign bonds it's a question of state budget as green bonds are an additional way of receiving money. The additional money is a way for a state to enable them to finance particular project that will benefit the entire society and would have otherwise not been realized.

Me: Regarding Corporate bonds, what do you think are the main advantages to invest in green bonds? What are the incentives to issue green bonds?

A: When it comes to corporations issuing green bonds there is an additional reputational advantage. After the emission recent cases have shown that they get a lot of publicity and promotions which is really important in regard to one's reputation. Also, for international organizations banks like the IMF and world bank it looks really good, it's important and sets the right sign.

Me: And for investors, what are the advantages?

A: Well basically, owning green bonds with its label provides investors with more specific information about the bond and what their investment is used for, which are relevant information to them in order to make an investment decision. It is important to provide investors with comparable information, which is unfortunately not yet the case when we are talking about green bonds because until now it's really up to the issuer to provide this label and the information connected with it. There are a set of international regulations that issuers can use to determine which bonds are green or not but also the principles between themselves vary a lot so it would be important to have a more comparable framework so that investors can be fully informed and they get to understand the whole framework of green bonds.

Me: Are there any negative aspects? Which?

You already mentioned the lack of comparability as one negative aspect as well as the absence of regulatory standard…

A: It's absolutely correct. Of course, it's important to understand why regulations are needed in the first place. You regulate because you want a market to grow. I'm usually not in favour of regulations. It is very important to really be sure why we need to regulate and if there is a need in general. When the technical group made suggestions, they introduced the taxonomy which serves as a classification system to mitigate the risk of greenwashing. Because when you don't have a label that defines what exactly a green bond, brown or light green or dark green bond is, you won't actually have labels that investors could 100% securely use to make decisions. It's also important to make a distinction between sophisticated and retail investors. Maybe the institutional have more information on what the Green bond principles are for example or know about other principles and all about their investment while to retail investors it's not that clear so they are more in need of legal regulations. If there are no regulations even with regard to rating agencies their rating will get messy or untrustworthy. So, to conclude I think greenwashing is one the biggest risks, but there are several entities working on creating exactly those regulations that are needed to mitigate that risk.

Me: At present, one can find statements in the literature to the effect that the yield of green bonds is higher than that of conventional bonds, while in others it is lower. Which position do you agree with?

A: I don't agree with either of them. I don't think it's a question of being green or not but of what kind of bond we are looking at in general. Being green or not is just an additional lawyer on the bond type. I actually think that those papers that state one or the other are sponsored literature to be honest. Regarding your question, there is no answer you can give in a generalized way. It always depends on the way of the bond. There are ones that have higher impacts, it also depends on the issuer as well and how their default risk is for example. Also, maybe in the past the discussion was rather mainly always just on the profit's and a rather narrow, nowadays I think the culture is moving slowly and I think the market is more open to new to products that don't only have an financial reasoning behind them but also others aspects.

Me: How would you classify the risk of green bonds? (To answer this question, you can also compare the risk with conventional bonds)

A: Here I would exactly say the same as on the question before, it is not possible to generalize. It is dependent on different aspects and not just focused on its green label.

It is actually more about comparing what is comparable, which brings me back to the lack of taxonomy. For example, some bonds that issued by Chinese corporations and are labelled as green can’t necessarily been considered as green in the EU since when looking in the taxonomy of Chinese green bonds, they actually have coal in it. But in the European one it’s totally forbidden, so not everything can automatically be compared. The EU taxonomy is for example rather for the developed world, maybe the taxonomy for China and other countries are rather developed in a way that helps their transition. Th EU cannot just propose something and expect the whole world to just follow it especially if it’s not suitable to their situation and possibilities, there is really a risk of comparing things that are not comparable.

Me: Although the green bond market has grown a lot it’s still a relatively small part of the bond market. What do you think are the main challenges?

A: It’s basically the ones that I have mentioned before, but the main I would say is the lack of regulatory standards that result in risks of greenwashing.

Me: Do you believe that mandatory regulations for the issuance of green bonds and the definition of "green" would help the further development of the market?

A: Yes definitely. Regulation is a very important tool to provide more certainty to the market but at the same time we need to be realistic in terms of the purpose and features of the regulations. And to tackle mandatory regulations for the emission of green bonds on an international level we have to take into considerations that there are different layers, such as locally, regional and global markets. So, if you want to tackle all of them and avoid green washing to the public it's important to frame regulations in a smart and holistic way.

Me: What (Regulation, tax incentive or other tools) do you think must/could be improved in favour of the green bond market long-term?

A: Tax incentives to boost this market are very helpful. But at the same time, we need to be careful about the limitations of the European union to tackle tax issues, so that is something that all member states need to agree on and move together with it. I agree with some incentives are needed but the measures should be very thoughtful and realistic.

Me: Do you think the risk of green washing can be mitigated in the future? If yes do you have something in mind about how?

A: Yes, as I said already. With this kind of regulation I mentioned before yes, and also with authorization of the companies that are providing this kind of third-party views, so as it's happened for the rating agencies nowadays and since the EU regulation this kind of agencies are authorized by ESMA and I think and strongly believe that setting up this kind of framework where you have all this kind of entities providing their opinion on the greenness of a bond should actually be subject to a registration or authorization process and ESMA actually potentially the authority with power to authorize this kind of entities- Precisely to mitigate the greenwashing risk.

Me: From an issuer perspective, what needs to be done/changed to increase green bond supply?

A: It's really tricky. I think we need some scale; we need to scale up the green bond market. By the way I'm Portuguese, and for example Portugal is on good tracks in terms of the environmental targets that were set up from the commission for 2030 and 2050- and from an issuer, sovereign issuer perspective if we can make a distinction here between sovereign and corporate bonds- from a sovereign perspective there is actually no incentive to issue a green bond because actually we are on track. So also, in Portugal we lack projects with the capacity to actually issue a bond. As you know to issue you a bond you need to have scale, you need to have capacity and you need to have projects because it’s extremely expensive to build all the projects and to set up the bond, the perspective, the lawyer and consultants and everything and for an issuer like a sovereign issuer, they have to make sure it’s disclosed with all the requirements, and one year after again, so it’s really a lot of work. But to respond to your question what I think really needs to be done is you know we need to increase the scale. For example, between Spain and Portugal there is a huge discussion regarding energy and an Iberian energy union, this could really increase their potential in regard of energy and build some synergy and I think that’s the kind of strategy that could wave the critical path and help them to build a market and provide more opportunities for issuers.

Me: Currently there is more demand than supply in the green bond market, therefore green bonds are often oversubscribed. Do you think demand will stay as high, grow even more or emasculate?

A: I think if this momentum is not just a momentum about climate change, the demand will stay high there will be more projects or opportunities to build around climate, social and sustainable issues so in my view actually all the proposal from the European commission will move forward and if this topic is actually is discussed at the global international level the trend will be keeping demand extremely high.

Me: How do you think does the future of Green bonds look like? Is there a future or wont there be a differentiation between green and conventional bonds five years from now? Do you think that in ten years’ time all bonds will be green?

A: I think the trend will be, this is really my thought, about this topic in the future there will be no green bonds, all the bonds will have or need to explain and to disclose the impact that it will have into the economy. So basically, when you have prospectors you have risk assessment impact and I think one that will be mandatory will be to elaborate on the impact of bonds on the climate, on the environment into the social world, you know. I’m not talking about in five years but maybe in ten years it will be something that will fall into mainstream. Because precisely I believe that the green bond market and all the green climate related, financial and nonfinancial discussion will remain in the future, not only remain but will totally be embedded in the discussions. So, in the future you don’t need to specify if it’s yellow, green red or something. Really it will be into the bond, I mean a solid component, in principle embedded into the bond.

Me: To summarize your answer, so you said because climate change is not a topic that concerns us now but it’s rather a topic that will accompany us for a long time in the future if not forever, there wont be a distinction between green or conventional bonds in the future since all bonds will be climate related and the bonds that we call green now will be the conventional bonds of the future.

A: Yes, summarized perfectly, that’s exactly what I meant.

Me: Thank you, that was my last question! Thank you very much for your help and detailed reply.

2.2 Interview B

Me: To what extent do you deal with green bonds?

B: I basically work in a sustainable finance team of a multinational bank and one of our offerings are green bonds. I’m not exclusively dedicated to that product nowadays, I used to be full time working on green bonds at Sustainalytics before. 30% of my time now I would say are dedicated to green bonds, and I offer green products to clients in every client conversation

Me: The green bond market has grown drastically. Why do you think that’s the case?

B: So yes there has been tremendous market growth, looking on the overall bond market its still a very small percentage of the overall outstanding's but in terms of percentual growth over time quiet impressive in terms of speed of growth. We have seen a few drivers on that, one of them has definitely been the Paris agreement in 2015 also followed by the and of course an increasing urgency in the society to address climate change issues and environmental issues in general, so these have been the drivers pushing in the green bond market, and what have seen is that companies also want to show increasingly in their leadership but also in their strategy around sustainability so issue green bonds it's a good way to communicate their vision to the stakeholders. So, I would say the whole change in society and the political agenda have been driving this growth.

Me: The next question would have been "What do you think are the main growth drivers?" But I think you mentioned that quite detailed in the previous question, is there anything you would like to add?

B: No I think that were the main ones, but also for the European union in specific we have seen a very strong push from the European commission in sustainable finance action plan which is also quiet important to mention.

Me: Regarding Sovereign bonds, what do you think are the main advantages to invest in green bonds? What are the incentives to issue green bonds?

B: So also, a bit related to companies but it is again a strong focus on social programs, politicak message to corporates sector and agencies to align with the governmental policies. We expect that once governments issue green bonds, that is also a signal to corporates on okay this is the governmental agenda we know where they are heading too, and we also need to align our strategies with the policies.

Me: Regarding Corporate bonds, what do you think are the main advantages to invest in green bonds? What are the incentives to issue green bonds?

B: I think for corporates there is the advantage of investor diversity, also for sovereigns but maybe to a different extent. But investor diversification is really an advantage that comes along with green bonds. For corporates its quite important it gives them the opportunity to speak with investors about the benefits and strategies on sustainability which is something corporates will look for.

Me: And for the investors, what are the advantages?

B: They actually have a better understanding on where the money is going to because green bonds inform about their use for proceeds which allows them to make certain claims about the portfolio that they manage and the impact of their portfolios. There is also an increased transparency and reputation benefits for the investors.

Me: Are there any negative aspects? Which?

B: It depends a bit on the perspective, it requires more work than a conventional bond. You need to develop a framework, you need to have a second party opinion, you also need something to track the project, according to best practice you need to have an impact report as well. So, there is an additional due diligence process, and also it costs money which also is barrier although I wouldn't say its significant but it requires commitment from the company.

Me: At present, one can find statements in the literature to the effect that the yield of green bonds is higher than that of conventional bonds, while in others it is lower. Which position do you agree with?

B: There is no side to agree on, as it really depends on the issuer. There is a bit of a mix of opinion here as well. So, I would typically recommend the climate bond initiative literature on that, but they have a study on the pricing differences between green and conventional bonds.

And we do tend to see some pricing benefits which is positive and supports green bond issuers but we also need to keep in mind that the credit rating for green and non green bonds is the same so if you would give a significant discount to green you would probably loose some investors that try to optimize risk and return so I think it is important to have some caution about how differential green and conventional bonds can actually be.

Me: Although the green bond market has grown a lot its still a relatively small part of the bond market. What do you think are the main challenges? Besides the additional cost that you mentioned before.

B: Well a lot of people would mention the lack of diversity of projects we are currently seeing because right now the most projects are in the area of energy and green housing and it needs to get diversified of course. And then the approach of being a use of proceeds only is currently being discussed, so that’s still a question mark in the market, which is also challenge which is difficult to track. There are some changes in the market, lets see how they progress. Another risk is the current discussion on what is the exact definition of green, and the European union taxonomy is also an approach to get some clarity there but some people say its too strict and not significantly support the growth of the market so yes I think taxonomies that are too strict can also be a barrier in the market.

Me: How would you classify the risk of green bonds? (To answer this question, you can also compare the risk with conventional bonds)

B: So the risk of green bonds is always linked to the corporate risk so if you have a green impact bond that is actually linked to a specific project when we talk about social impat bonds we know okay its an investment in education or a project with prisoners and then in five years in time its all worked out and you can actually get your payment from that investment. For green bonds the risk is always linked to the issuer, so it doesn’t matter if the project goes through or collapses but the payment the payment will be still done since the risk is not project linked but its linked to the issuer. So yes, maybe you could say this asset are more resilient than other assets and they should gain some benefits because they contribute to the political agenda as well. But in terms of risk there is actually no correlation proven between environmental project being less risky than others.

Me: Do you believe that mandatory regulations for the issuance of green bonds and the definition of "green" would help the further development of the market?

B: Yes and no. I think the current guidance that has been there in the market by the Green bond principles have been sufficient to a certain extent to ensure good practices, and to a large extent ensured market integrity being financed so yes it help to have some additional guidance on what is green and what is not. But having strict regulations in place is not necessarily the best approach I would say. Also, if you think about what is green today might not be green tomorrow is kind of constantly evolving so you need a flexible standard and I don’t know to what etend that will be achieved by regulations. Well regulations are important to give some guidance but not specific definitions those need to be more dynamic.

Me: What (Regulation tax incentive other tool wise) do you think must/could be improved in favour of the green bond market long-term?

B: What I think can be done is some incentive schemes like the Singapore monetary authorities have done which is creating a fund which helps funding the costs of green bond issuance, so if you are an issuer you can actually pay for the additional costs by getting money from this fund. And yes, there is the question of tax incentives, the question for the future when its proven that green bonds are something that somewhat make sense to have. Its very easy to say we should give lower pricing and other incentives, but it has to be based on certain pools and Im not sure if we are there yet.

Me: Do you think the risk of green washing can be mitigated in the future? If yes do you have something in mind about how?

B: I think there are some important points here, one of them is the role of the taxonomy and the definition of green standards in order to avoid this green washing so I think they are beneficial in that sense. I think its also important to understand that not all investors have the same requirements on what is green. So maybe dark green investors will say we only buy bonds from projects that are dark green while others are already satisfied with light green projects. So we need to be a bit cautious, because also in the end the market will choose which bonds are green or not, investors will be very critical, the best example is Repsol where the market reacted as a unit when Repsol issued their green bonds that was not a credible green bond, although it had second party verification. So, I think there are some open market reactions to greenwashing, which is also a reputation risk to issuers. They don’t want to come into the market with a weak bond because it will be spotted its very public. On the other hand, there are also new types of bonds that keep coming up, transition bonds where some investors say there are light green while others say no they are just less brown. So that will also be decisions on the market where these bonds will be placed, and investors get to say what is green to them. But its hard to have a universal definition of green because its not possible, there are some helpful guidance available as I mentioned before, but in the end greenwashing risk will emasculate by itself through investor and market reactions.

Me: From an issuer perspective, what needs to be done/changed to increase green bond supply?

B: It will help to cover the additional cost that is needed for the emission of green bonds, a lot of issuers find identifying project quite burdensome. So, if that there is a change from what we currently see in the use of proceeds towards a more general corporate financing that is linked to KPIs that will definitely increase the supply of green bonds because it will decrease the burdensome of emission green bonds. Also, maybe good to understand, that if we talk about green bonds, we are talking about 500Mio issuance size, that's a lot of projects to get to that.

Me: Currently there is more demand than supply in the green bond market, therefore green bonds are often oversubscribed. Do you think demand will stay as high, grow even more or emasculate?

B: Demand will keep growing. We even see central banks getting involved, so definitely keep growing.

Me: How do you think does the future of Green bonds look like? Is there a future or wont there be a differentiation between green and conventional bonds five years from now? Do you think that in ten years time all bonds will be green?

B: It depends a bit on how the market standards will evolve, like the green bond principles, because if we see the current movement around use of proceeds, and we ignore them eventually in that form they are right now I think there is a high probability that green bonds will be fully integrated in to the conventional bond market. And we will have different shades of green and transparency on that, depending on the issuer. If we continue with a market that is focused on the use of proceeds then I think it will still have a very important role on the market and it has a very strong credibility attached to it what is something I personally appreciate but if it will become completely mainstream- no I don't think so. It all depends on how the rules of the market will develop.

2.3 Interview C

Me: To what extent do you deal with green bonds?

C: I sit in the environmental social and governance team of an international rating agency and I have been working on green bonds in some capacity for about 4 years now and I am the lead author for our quarterly green bond market update report, that looks at the global trend on the green bond market and increasingly now the social and sustainability bond markets. I am one of the leads for our green bond assessment products, that is an external review upon the various credentials that the green bond brings to market around the organization, reporting and management proceeds. So we are focussing on that product on the research side and also on the outreach on the market like meeting investors, bankers, financial advisers and issuers around the developments on the market and increasingly my work and focus expanded to not just on green bonds anymore, but also on social sustainability bonds and some other product innovations that are coming on the market.

Me: The green bond market has grown considerably. Why do you think that's the case?
C: It is really a number of factors. I think we see demands from the investors side and the understandings from the issuers side. For issuers it is a way to highlight the sustainably credentials of their operations and the projects they are financing and they are seeing the benefits of an employee engagement from an investor diversification side, there is anecdotally sometimes a pricing benefit for issuers, but that is not always the case. So what we do here, almost across the board, is, that issuing a green bond allows an issuer to attract investors, that are either focussed on ESG, sustainable or socially responsible investment or whatever their mandate is and they are often new investors for the issuers, so they are able to diversify their investor base, grow the numbers of investors interested in the company and for the issuer and from their perspective it is just like any other offering, except they just have to allocate proceeds to green projects, so it is not that much difference from a structural standpoint.
And then from the investors side, they are seeing all types of client demands for sustainable products. The investors get a greater transparency and disclosure from the issuers who are issuing green bonds, around the projects they're financing and often about the ESG and the sustainability credentials of the issuers more broadly. So investors have demands for the product and there is also the regulatory push to focus more on sustainability in investment and also

seeing risks associated with climate change, that is reranting how investors think about investing in companies, that are really looking to help the climate change and to be more sustainable.

Me: What do you think are the main growth drivers?

C: We are definitely seeing the Paris Agreement providing a framing mechanism for issuers, for governments and for investors to think about their investments and we have seen some of the sovereign governments specifically tie their green bond programs to the Paris Agreement. We personally have worked with Nigeria, Poland, Lithuania and all of them tie in some way their investments and green bond frameworks to the Paris Agreement. So, I think especially at the sovereign and sub-sovereign governmental level, the Paris Agreement driving issuance and also a framing mechanism. With the EU plan, it is a little early to tell. I think our general thought is, that having a standard that could potentially become global over time, would put some market fierce around the green washing that exists and could potentially lead to longer term growth. But right now, the taxonomy is not finished, that the EU action is based on and it is now likely going to be delayed from an implementation standpoint until 2022. So, it is a little too early to tell what impact that will have on the green bond market, but I think it is clear, that international standards and guidelines will help drive investments in this area. It is just tough to say exactly what impacts these standards have on the market. I think it is really been more of a market driven growth and a have been sort of a regulatory driven growth at this point.

Me: Regarding Sovereign and Corporate bonds, what do you think are the main advantages to invest in green bonds? What are the incentives to issue green bonds?

C: I think for Sovereign and Corporates it is the investors diversification reasons, the sustainability highlighting reasons as a way to talk from a PR and marketing perspective, so they can show what they are doing. For Sovereign the constituents are looking to more in terms of citizens of the region whether it is a country or if it is a local government, that could be a city or a county, and for corporates its a bit more their customers and their employees that they could appeal to more than their constituents. So, it is a slightly different reason from our perspective for Sovereign and Corporates, but the treasury department that works with that topic the are seeing the investor diversification and they still were aware despite the fact that there are slightly different types identities.

Me: And for the investors, what are the advantages?

C: I think it is just that they are appealing to their clients, they get more transparency and disclosure and they are potentially also investing in the companies that are working in a sustainable field, in other words that green bonds are a legitimate part of the overall strategy for the issuer. Then they are potentially also channeling capital to issuers that are preparing themselves well for the climate transition and the climate change and sometimes long-term changes that are occurring.

Me: Are there any negative aspects? Which?

C: It is really around the costs and it is both on the issuer and the investor side. For issuers one of the reasons not to issue a green bond, is around the time and not so much the financial cost but the time cost, that comes along in issuing or rather setting up a green bond. So, before they issue their first green bond, issuers often have to set up a green bond framework, they have to set up reporting processes, management structures. They also have to get an external review on the green bond which costs some money and it is also the screening on an ongoing basis. Most investors want to see at least an annual reporting on how their money is being spent and what sort of environmental benefits are being achieved by the projects. So that costs time and some money as well and you need someone to do that reporting and tracking, so that are the implemental cost for the issuer. The investors, since the credit risks are the same for these instruments, the only difference is the fact that they are allocating their proceeds to green projects. So, from the investors perspective the credit risk is not really any different, they do not want to pay more for the bond but they want the increased disclosure and the increased transparency. So, the issuers have to pay a bit more and the investors do not want to pay for that, so a little bit there is some kind of a mismatch in those implemental costs. So I think that's really one of the fundamental challenges in the grwoth of the market and then there is also, I would say its not as big of a consideration as some of the markets would lead you to believe, but I think there is that green washing consideration as well, where investors, due to the lack of formal and international standards and coordination among „what is green?". So, some of that confusion leads to some potential concerns for investors what they're buying is legitimately green. I think that's one of the challenges as well that is holding back even more rapid growth from the market.

Me: At present, one can find statements in the literature to the effect that the yield of green bonds is higher than that of conventional bonds, while in others it is lower. Which position do you agree with?

C: From a structural standpoint, if we are looking at the credit risks from a leading rating agency perspective, there should not be any difference from a credit risk perspective. From a pricing perspective, we have seen some other literature, I do not think it is definitive what the answer is in terms of whether there is a pricing benefit or not, but I think we are hearing part anecdotal evidence, that there is a pricing benefit in some cases, but its not guaranteed, so that's sort of our working assumption right now. And one of the challenges we have heard, but even this I wouldn't say is guaranteed, that there's a little bit less liquidity on the market, because the market is not as robust at this point, it is not that big compared to the conventional bond marktet and a lot of times the investors who buy the paper tend to be buying into whole long term investments and don't want to put it up and sell it once they get it. Since there is a supply-demand mismatch, they tend to try to hold on to the paper. So that is something we have heard, and you could argue that there is higher liquidity risk then, but I do not really think that is material. So again, these pricing dynamics are not guaranteed it is just to say whether there is higher investment risks, it is not really something we look at in our role but from a pure credit risk perspective it should be the same.

Me: Although the green bond market has grown a lot its still a relatively small part of the bond market. What do you think are the main challenges?

Me: You have mentioned several already, are there any more you would like to add?
C: I think those are probably the biggest challenges that we see. There is in some markets and some sectors a lack of availability of projects we have heard, so I think this is especially true in emerging markets, where issuers want to issue green bonds, but they do not necessarily have the projects to do it. Or the projects are small to the extent that you would not be issuing sort of a capital markets bond to finance them. So, for some smaller governments they might not be issuing a green bond, because its not large enough to act as a benchmark bond. So, for some of the smaller issuers there's been some discussions of bundling projects and how could the states get involved to make these more attractive from a broader perspective. So those are also cases but only for certain issuers, emerging market issuers or smaller issuers. When we are talking about moving the big issuers over, it is more the cost, the green washing considerations, those are I think bigger issuers and I think also the complexity around that costs.
Me: Do you believe that mandatory regulations for the issuance of green bonds and the definition of "green" would help the further development of the market?

C: Yes. So what we said is, it would probably help long term, that in order to have this really be a market of a size that rivals sort of the existing fix income market, there probably needs to be greater standardization or regulation over what exactly „green means“ so you could argue that something like the EU action plan taxonomy and green bond standard would be a step in that right direction. There has been a lot of concerns around the usability of the taxonomy. We have heard a number of complaints in the market, some people saying it is too strict, other people say it is too accommodative. So, it is unclear, if that is the answer to the market, concerns around the lack of standardization, but I think it is a step in the right direction. Whether that takes off to a go to standard remains to be seen but if regulation and standardization occurs in a way that allows there to be flexibility and genuity on the market. So yes, I would think that is something that would help the market. But if regulations come in and not very flexible it would not really be workable for market participants or issuers who have to deal with market complexities, that could actually potentially hinder market growth. A little too early to tell, but I think it is something that could help over time.

Me: What (Regulation, tax incentive or other tools) do you think must/could be improved in favor of the green bond market long-term?

C: It is all about the details of these regulations, so it is hard to say broadly what would help but there has been some discussion about having, in the US, in certain states different tax treatment for green bonds. Theres some discussion in the EU about so called green supporting factors, that would have different capital requirements for banks for green vs. non-green assets. Those sorts of things all have sort of an argumentative actuality, whether that is appropriate or not is not a difference in risks for the instruments. I think there is implementation barriers around all of these things, but of course, if they become embedded in the regulatory environment investors are mandated to buy green, banks are mandated to hold green, issuers are mandated to issue green, so of course that is going to grow the market. But there is a lot of questions around of what the different proposals mean from a market perspective.

Me: Do you think the risk of green washing can be mitigated in the future? If yes do you have something in mind about how?

C: I think having a bit more clarity around a taxonomy defining „what green is" will help to make a step in the right direction. So the green bond principle that were existent as sort of the best in class guideline for the first few years they were around, very vague in a lot of ways, so it opened the door to interpretation around „what green is” and what is not. I think most issuers, or the vast majority of issuers have not issued bonds that would be considered green washed. There have been a few instances in high profiled cases, but I think those are a fewer number to be honest and there are certain areas or issuer types where we see it a bit more. In China for instance, they have allowed clean coal investments as part of their taxonomy standard. Obviously if they were to take that out and align more with international standards, that would be something, that would help the market. But again, it is all about how these things get implemented and not so easy. Let’s just say if we have a standard around what is green, then we’re good over night, its much more complex than that.

Me: From an issuer perspective, what needs to be done/changed to increase green bond supply?
C: I would say a pricing benefit that was much more build in, which would be a sort of a round about way of defraying the cost of issuance. That would be a clear motivating factor for issuers to go through the time and effort to do it. If they are likely to get benefit if they are issuing a green bond vs not, then a hundred percent yes, that’s going to move the market but there is a bit of ambiguity right now around whether that is actually the case, so some issuers are a bit hesitant to go down that path. Even the standardization around defining „what is green” would help issuers as well. It would give them a bit more clarity that they are not going to put themselves out there, issue a green bond and then have a really bad media reaction. I think there is still some doubts around that. There have been some cases where the issuers try their best effort as they saw it and the markets basically rejected the offering and had a lot of bad media attention. Just having some greater clarity around „what is green” would actually help the issuers and not just the investors.

Me: Currently there is more demand than supply in the green bond market, therefore green bonds are often oversubscribed. Do you think demand will stay as high, grow even more or emasculate?

C: I think we are, generally speaking, in a market condition, where it is a little rare environment. There is a lot of reaching for yield, there is a lot of negative rates government bond especially in Europe, so it is not just green bonds that are oversubscribed, it is general offerings as well. Forgetting broader fixed income market conditions, I think there is going to be continued demand. Just the amount of capital that is looking at the ESG and Sustainable development goals should increase the supply and demand on the market. So as long there is no significant concession in pricing the investors need to take, then I do not see any reason there would be less demand where it is today, just given that there is such a strong demand for these products. Like I said, the credit risk is theoretically the same when they get more disclosure around what the issuers do, so there is really no downside for the investors as long as you are not paying too much for the offering.

Me: How do you think does the future of Green bonds look like? Is there a future or wont there be a differentiation between green and conventional bonds five years from now? Do you think that in ten years time all bonds will be green?

C: I would not say five to ten years. I do think there is long term potential, that there is a time, when we are talking about brown bonds or brown assets more severe than we are about green. It is more a penalty, whether from a regulatory or a market perspective, to issuers, if they are not doing green investments. Tough to put a time frame on that, but I think it is probably beyond five years and potentially beyond ten years, depending on how quick regulations come in. We are starting to see already a change in the market, it is not just use of proceeds for green bonds anymore, there is also social and sustainability bonds, there is this concept of transition bonds for issuers that are not quite green today but are working towards that. There is SDG linked bonds, that are tied to the UN sustainable development goals and now we are seeing a change in structure, whether if there is sustainability linked loans in bonds, where the pricing is directly tied to whether the sustainability credentials get met. So, I think we are seeing a diversification in the product types, in the labels. So, it is not just green bonds anymore it is a much broader set of products. As Banks, investors, and issuers all see the value in sustainability and sustainable finance, there is going to be a push continued in diversified products and projects. So issuers are using the products that make the most sense to them, banks and investors are looking for competitive edges against one another, so this is all going to continue to develop, so it is not going to be just green bonds anymore, but yes I do think in the future bonds that re environmentally friendly will eventually or definetely have the potential to become mainstream.

2.4 Interview D

Me: To what extent do/did you deal with green bonds?

D: I have been investing in Green Bonds for eleven years and have launched and managed three Green Bond funds.

Me: The green bond market has grown drastically. Why do you think that's the case?

D: The Green Bond product is a great concept. For investors, it provides transparency and impact, in addition to a normal structure and return of a conventional bond. For issuers, Green Bonds assist with their funding needs

Me: What do you think are the main growth drivers?

D: The need. Climate Change is becoming more acute. Retail and institutional investors are increasingly concerned for not just an investment return but also investments which are aligned with their values.

Me: Regarding Sovereign bonds, what do you think are the main advantages to invest in green bonds? What are the incentives to issue green bonds?

D: Sovereign Bonds

Investors:

1. Transparency
2. Impact
3. Market Return
4. Liquidity – as sovereign issues tend to be larger

Issuers

1. Diversifying their investor base
2. Underlining their sustainability credentials to their electorate
3. Perhaps helping them meet their sustainability goals under the Paris Agreement

Me: Regarding Corporate bonds, what do you think are the main advantages to invest in green bonds? What are the incentives to issue green bonds?

D: Corporate Bonds

Investors:

1. Transparency
2. Impact
3. Market return
4. Green Bonds may help transform corporates in to becoming more sustainable

Issuers:

1. Diversifying funding base
2. Perhaps issuing a Green Bond has a halo effect for the issuer, that is it may underline their sustainability credentials implying possibly they might be less of a credit risk in the future, so having a positive impact on the issuers whole credit curve

Me: What are the main advantages? For issuer as well as for the investor?

Please see the fourth and fifth question.

Me: Are there any negative aspects? Which?

D: See question 10 regarding the main challenges, one negative aspect would be the current additional cost coming with the emission of green bonds.

Me: At present, one can find statements in the literature to the effect that the yield of green bonds is higher than that of conventional bonds, while in others it is lower. Which position do you agree with?

D: Because the credit risk is the same for a Green Bond as it is for a conventional bond from the same issuer, the credit spread, and yield should be the same.

Occasionally, bonds trade out of line, but that is the same for the conventional bond market too.

Me: Although the green bond market has grown a lot its still a relatively small part of the bond market. What do you think are the main challenges?

D: Keeping the issuance process simple. The easier it is, the more issuers will come to the market with green Bonds.

Me: How would you classify the risk of green bonds? (To answer this question, you can also compare the risk with conventional bonds)

D: Only a small amount of Green Bonds are secured on their projects. For most, the risk for the investor is the balance sheet of the issuer – as it is with conventional bonds. So, there are perhaps two main risks –

1. Credit default risk as with conventional bonds.
2. Weak green impact.

To issuer, the risk is reputational risk if investors perceive their Green Bond issue too weak in impact

Me: Do you believe that mandatory regulations for the issuance of green bonds and the definition of "green" would help the further development of the market?

D: There is some role for an EU taxonomy as there should be more than a shopping list of eligible projects. It is helpful to have a classification and minimum impact thresholds. However, there also seems to be consensus in the market that environmental issues are not binary i.e. not black or white. Rather in this case, there are many shades of green.

Additionally, the green bond market is highly innovative and so any framework must be flexible enough to accommodate innovation.

Innovation in the green Bond market is also very fast moving

Me: What (Regulation tax incentive other tool wise) do you think must/could be improved in favour of the green bond market long-term?

D: It would be helpful if policy-makers / regulators / nations, etc to provide grants for issuers to pay for second party opinions and impact reporting, so reducing the costs for issuers

Me: Do you think the risk of green washing can be mitigated in the future? If yes do you have something in mind about how?

D: Greenwashing in the green bond market is over-estimated. Very few issuers – if any - set out to deceive the market. Rather there are Green bonds with weak impact – mainly in Emerging Markets – because the issuer has not really understood what is involved

IFC is helping with Green Bond training programmes in Emerging Markets

Me: From an issuer perspective, what needs to be done/changed to increase green bond supply?

D: Please see 10 and 12.

Me: Currently there is more demand than supply in the green bond market, therefore green bonds are often oversubscribed. Do you think demand will stay as high, grow even more or emasculate?

D: There is more supply of Green Bonds now sovereigns are issuing Green Bonds. In fact, the market is awash with Green Bonds if we include Chinese Green bonds. I think both demand and supply of Green Bonds will grow in the future providing investors do not have to pay a premium for a Green Bond; and providing the issuance process for issuers does not become too bureaucratic

Me: How do you think does the future of Green bonds look like? Is there a future or wont there be a differentiation between green and conventional bonds five years from now?

D: Five years from now, conventional bonds may look more like green bonds i.e. they may disclose their use of proceeds or impact. Green bonds are more than a fad – they are a win – win – win product for investors, issuers and the planet

2.5 Interview E

Me: To what extent do you deal with green bonds?

E: I work for a German direct bank that uses its customer deposits exclusively to finance ecological loan projects. I have daily points of contact, as issues / secondary market securities are also offered daily. With regard to Green Bonds, we have not set any quotas in the sense of "Portfolio share x must be a Green bond", since the financial institution Im working for controls the issuer's ecological rating.

Me: The green bond market has grown drastically. Why do you think that's the case?

E: I would say there are 2 relevant aspects that need to be mentioned here. First of all the pressure from shareholders and stakeholders who expect ESG reporting. Secondly, the need of

Companies to "buy" more consciously, as attention is paid to which securities are in the portfolio which are in turn related to positive reputation effects.

Me: What do you think are the main growth drivers?

E: Regarding the buyer side its related to what I just said before. Looking at the seller side there are lower spreads when the bond is issued, in other words non green bonds will have a higher yield at the time of issue than Green Bond under the same terms and conditions. Another aspect in favour of the green bond market is the potential of attracting new groups of investors who would not otherwise invest in the company's "standard bonds".

Me: Regarding Sovereign bonds, what do you think are the main advantages to invest in green bonds? What are the incentives to issue green bonds?

E: Generally, on the sell side lower interest rates as mentioned before are an advantage. Furthermore, it illustrates a role model function and brings along reputation effects (state leads the way, economy "must" follow), and if they don't go along with it, it has possibly negative reputation effects. In addition, the development of new investor groups is an advantage.

Me: Regarding Corporate bonds, what do you think are the main advantages to invest in green bonds? What are the incentives to issue green bonds?

E: Green bonds can also theoretically endow companies that would not endow due to the original business model (expansion of investment spectrum). Also, there is a reward function, in other words as an investor one can consciously not reward "not green" and participate in the funding if they emit "green", in form of an educational effect (business mission).

Me: And for the investors, what are the advantages?

E: First of all, as mentioned before the general fulfillment of their business mission or fulfillment of stakeholder requirements at minimum level ESG orientation. Moreover, the

Insurance" of the investors against certain negative (environmental) effects. The green label is a type of insurance against environmental risks / reputational risks that may be present in the issuer's original business model. (Hence possibly also the topic: Low coupon of the Green Bond compared to the conventional bond => insurance premium the investor is willing to pay).

Me: Are there any negative aspects? Which?

E: Currently, global standards are missing so far. In principle, even the term "green bond" is not protected (even if it means GBP). In addition, there is no link to the issuer's actual business model, in other words even very "non-green" issuers can issue a high-quality green bond, which bares in some extent risks of greenwashing. Here I would like to see a link between an issuer rating (ecological) and a green bond. Similar to rating didactics S&P, in which an anchor procedure is chosen for the industry and then premiums and discounts are calculated.

Me: At present, one can find statements in the literature to the effect that the yield of green bonds is higher than that of conventional bonds, while in others it is lower. Which position do you agree with?

E: I think it depends on the viewing angle. When issued green bonds have lower yields than conventional bonds, as the issuer "has to write less interest on the paper". Classic buy-and-hold investors should therefore achieve slightly below-average performance. When it comes to active trading: From my market observation on the secondary market, Green Bonds are more expensive than classic bonds, which means excess yields can come from selling during the term (as there is excess demand this leads to rising prices = > excess yield possible). That is my explanatory approach, but I did not conclusively evaluate the studies.

Me: Although the green bond market has grown a lot its still a relatively small part of the bond market. What do you think are the main challenges?

E: One challenge is to have correspondingly good assets as an issuer in order to issue green bonds at all. Similar to Pfandbriefe, the cover pool simply has to be right. Furthermore, the mentioned missing standards illustrate a challenge for the growth of the market. Some issuers, from my point of view, refrain from larger programs as long as “the market standard” has not been defined.

Me: How would you classify the risk of green bonds? (To answer this question, you can also compare the risk with conventional bonds)?

E: Generally I would say they have the same risk as any other bond, because it is one and the same business model (unsecured bonds!) and "only" a cover pool of green exists, hence liability cascades etc. are identical, green and non green are on an equal footing. In terms of reputation, it can be an advantage to have invested in green projects in the case of default. However, at the financial institution I work for this is already being controlled via the sustainable issuer rating, which is why in our model we do not assign any further imputed risk costs to the green factor at bond level.

Me: Do you believe that mandatory regulations for the issuance of green bonds and the definition of "green" would help the further development of the market?

E: I think that would definitely help, since there are currently several taxonomies in circulation that would be suitable as standard (CBI, GBP, etc.). Here, clear boundaries would lead to more activity.

Me: What (Regulation tax incentive other tool wise) do you think must/could be improved in favour of the green bond market long-term?

E: Increase value and e.g. (if Green effect is shown for example. Co2) count it as "substitute" for emission certificates => emission certificate "only" penalty for emission (negative punishment), bond investment would, however, steer money positively. Further, it would be helpful to take ecological behaviour as an integral part of the classic company rating. Those who are good at SDG avoid risks, in other words the rating level should be influenced by this (order of magnitude 1 to 2 noches).

Me: Do you think the risk of green washing can be mitigated in the future? If yes do you have something in mind about how?

E: Yes, by including the issuer rating (ecological), in other words serving as an anchor for the bond rating. A system should be created which qualitatively separates green bonds. The Logic behind what I mean is that a green bond issued by a green company should also receive a better ecorating than non-green company with an identical green bond.

Me: From an issuer perspective, what needs to be done/changed to increase green bond supply?

E: As I mentioned before introducing market standards as well as the Incentives mentioned before in question twelve.

Me: Currently there is more demand than supply in the green bond market, therefore green bonds are often oversubscribed. Do you think demand will stay as high, grow even more or emasculate?

E: I expect demand to remain high as well as the demand to further rise, partly because the ECB's purchase programme is starting again, and green bonds will also be "affected" here. Moreover, the ECB will "suck" 10 to 20 percent of every new issue into its own books and thus reduce supply size.

Me: How do you think does the future of Green bonds look like? Is there a future or wont there be a differentiation between green and conventional bonds five years from now? Do you think that in ten years time all bonds will be green?

E: In five years we will see a significant increase in supply and demand as well as a market uniform taxonomy, but still rather separate markets between "green" / "non green". While in ten years, yes green / social will rather be the standard and possibly the declaration will also be reversed, i.e. "non greens" must be labelled as such because they do not meet standards. Green is not labelled because it is a market standard. Perhaps the conviction (which I would prefer) that not the bond but the company should be labelled may also prevail, in other words the company no longer needs the discriminatory function of the security at all, since it is intrinsically "green" per se.

2.6 Interview F

Me: To what extent do you deal with green bonds?

F: Linking its experience in environmental and climate protection finance and its standing in international capital markets, XX (Name of bank, XX due to anonymity) decided to comprehensively support the development of the green bond market. In 2014, XX entered the green bond market as an issuer with the aim to act as a catalyst in driving this market forward and intensify the strategic dialogue with investors and other market participants about ‘responsibility in capital markets’. Since then, XX has been a leading issuer of green bonds having issued green bonds amounting to EUR 21.5 billion in seven currencies so far. The net proceeds are linked to two XX promotional loan programmes that provide financing for renewable energy and energy efficiency projects.

XX also has been supporting the market as an investor since 2015. XX is building up a dedicated portfolio for green bond investments with a target volume of EUR 2 billion that is backed by a promotional mandate from Germany’s Ministry for the Environment. So far, XX has invested EUR 1.5 billion in green bonds on a global scale.

Acting as a vocal advocate of the market in various international initiatives, XX is actively engaged in the Green Bond Principles (GBP) being a member of the Executive Committee since

2015. XX is also part of the Technical Expert Group (TEG) that was set up by the European Comission under the “EU Action Plan on Financing Sustainable Growth” and contributes to the workstreams on the EU Taxonomy as well as the EU Green Bond Standard. Please find more information on our green bond activities on our website

Me: The green bond market has grown drastically. Why do you think that’s the case?

F: In explicitly articulating the use of bond proceeds, green bonds have raised awareness of climate and environmental issues among a broad range of capital market participants. Major political achievements like the Paris Agreement and the Sustainable Development Goals (SDGs) have given important impetus to the market in giving cause for hope that world leaders are tackling the most pressing problems of our time. Awareness has emerged that the investments needed to combat climate change and ensure a just and sustainable development globally by far exceed public funds. Given the enormous amounts needed, it has become clear that capital markets have to play a more significant part in the financing of the transition towards a sustainable economy and society. The green bond market has been at the forefront of that development. The fist green bonds were issued in 2007. Since then the market has grown very dynamically with global new issuance exceeding the EUR 100 billion mark for the first time in 2017. In 2019, the market has already seen new issuance volumes rise to more than EUR 150 billion.

Creating a new sense of responsibility, green bonds have also put focus on other sustainability dimensions, serving as a blueprint for social and sustainability bonds.

Me: What do you think are the main growth drivers?

F: Green bonds, initially introduced by Multilateral Development Banks, are now popular among a diversity of issuers worldwide. China’s financials drove much of the growth in the market in 2016, while corporates developed to be the dominant green bond issuer group in 2017 and 2018. For 2019, 43% of global green bond issuance so far has come from corporates, followed by banks (22%), SSAs (18%), and sovereigns (11%).

Besides a market diversification with regard to issuers and regions, new products in green format have been introduced (green ABS, green Covered Bonds). In addition, the market has also seen a whole supporting infrastructure develop from external review providers, to green bond indices, to dedicated green bond segments in stock exchanges.

Me: Regarding Sovereign bonds, what do you think are the main advantages to invest in green bonds? What are the incentives to issue green bonds?

F: By issuing sovereign green bonds, states can demonstrate their commitment to reach the Paris Agreement's 2 °C as well as national climate goals. Sovereign green bond issuers are in a prominent position to increase the supply side by offering highly liquid benchmark size investment opportunities and contribute to a further development and diversification of the green bond market. Sovereign issuers are also well-suited to serve as role model for other market participants.

Me: Regarding Corporate bonds, what do you think are the main advantages to invest in green bonds? What are the incentives to issue green bonds?

F: By issuing green bonds corporates have the opportunity to highlight their engagement in the area of environmental and climate protection to investors and sharpen their sustainability profile. Some corporates have made changes to internal processes and their business strategy in connection with issuing green bonds and have adjusted their business operations towards a greater focus on sustainability and "green".

Me: And for the investors, what are the advantages?

F: In contrast to regular bonds (where proceeds are flagged for general funding), green bonds provide investors with transparency on the use of the bond proceeds and offer an uncomplicated opportunity to invest in green projects without bearing additional risk (see question 10). If the issuer provides impact reporting, investors also get information on the impacts of their investments.

Me: Are there any negative aspects? Which?

F: Evaluating if a green bond is in line with an investor's expectations tends to be time consuming (evaluation of green bond framework, external review, post-issuance reporting) which can lead to a more complex investment process compared to regular bonds. However, there are also investors that buy green bonds like any other bond, where the fact that the use for proceeds are directed towards "green" is not that important in the investment decision.

Me: At present, one can find statements in the literature to the effect that the yield of green bonds is higher than that of conventional bonds, while in others it is lower. Which position do you agree with?

F: Green bonds have provided issuers with little pricing advantages so far, if any, compared to regular bonds although issuers face higher issuance costs with green bonds (for setting up a green bond programme, for external review etc.).

However, it has to be noted that bond pricing is influenced by a number of factors (market sentiment, timing, issuance strategy, maturity etc) which complicates a solid determination of any price differentiation.

Me: Although the green bond market has grown a lot its still a relatively small part of the bond market. What do you think are the main challenges?

F: One bottleneck for the development of the green bond market can be a lack of suitable projects and assets to be financed by green bonds. Closing the climate finance gap largely depends on setting the right course and the right political incentives in the real economy. Stable and reliable framework conditions in the real economy are needed to create investment security and encourage investments into climate change mitigation and adaptation projects.

Me: How would you classify the risk of green bonds? (To answer this question, you can also compare the risk with conventional bonds)

F: The majority of green bonds issued so far have been so called “use of proceeds” green bonds with investors bearing only the issuer’s credit risk (like with any other traditional bond) and no project risk.

Me: Do you believe that mandatory regulations for the issuance of green bonds and the definition of "green" would help the further development of the market?

F: While voluntary green bond market standards like the Green Bond Principles have worked very well to develop the green bond market so far, there was the demand to get guidance on eligible projects and to introduce more standardization in the market to increase efficiency by simplifying the investment process. The TEG “Report on EU Green Bond Standard”, published on 18 June 2019, proposes that the EU Commission creates a voluntary, non-legislative EU Green Bond Standard to enhance the effectiveness, transparency, comparability and credibility of the green bond market and to encourage the market participants to issue and invest in EU green bonds. The EU Green Bond Standard features a link to the EU taxonomy that reduces uncertainty on what can be considered as green, thereby reduces reputational risks.

Me: What (Regulation tax incentive other tool wise) do you think must/could be improved in favour of the green bond market long-term?

F: I think the EU taxonomy has the potential to improve the green bond market in the long-term by helping the market to develop and pick up speed urgently needed. The green bond market there has seen a long discussion which projects and assets can be considered to be green.

Therefore, defining what is green and thereby reducing reputational risk and barriers for issuers and investors to enter the green bond space is something, the market has been asking for.

Me: Do you think the risk of green washing can be mitigated in the future? If yes do you have something in mind about how?

F: Due to high degree of transparency, reporting requirements and reputational risk we deem the risk of greenwashing to be rather low. However, increasing attractiveness of green bonds might result in issuers and investors entering the market with lower ambition. In this respect the EU Green Bond Standard will play an important role.

Me: From an issuer perspective, what needs to be done/changed to increase green bond supply?

F: Please see answer to question 9.

Me: Currently there is more demand than supply in the green bond market, therefore green bonds are often oversubscribed. Do you think demand will stay as high, grow even more or emasculate?

F: Future developments in investor demand are hard to predict and depend on a number of factors (interest rate environment, green bond supply, market conditions etc.). However, a growing number of investors care about investing their funds in a responsible manner and supporting a more sustainable world. This is reflected, for example, by in a growing number of signatories to the UN Principles for Responsible Investment.

Me: How do you think does the future of Green bonds look like? Is there a future or wont there be a differentiation between green and conventional bonds five years from now? Do you think that in ten years time all bonds will be green?

F: Green bonds have the potential to be vital in financing the measures that are needed in reaching the 2-degree target. They are however no cure-all solution. As described under 9.

stable and reliable framework conditions in the real economy and political impetus are vital. In addition, there are other instruments that could be effective in the fight against climate change like accurate carbon pricing.

2.7 Interview G

Me: To what extent do you deal with green bonds?

G: My role is Global Head of ESG Fixed Income Research at British multinational Bank. So I cover green bonds, ESG and credit, plus ESG and sovereigns.

Me: The green bond market has grown considerably. Why do you think that's the case?

Issuers want to signal that they are funding environmental projects when then issue green bonds. Some investors want to buy bonds that are funding green projects. Lots of work done by ICMA (the International Capital Markets Association). As well as the situation of Climate change.

Me: What do you think are the main growth drivers?

G: Issuers are able to access a new set of bond investor when they issue green bonds. These investors may be more 'buy and hold' oriented than traditional investors. Issuers want to communicate their corporate environmental commitments. Asset managers want to own bonds from firms that are attune to climate change risks or trying to provide services that help cut emissions or build climate change resilience

Me: Regarding Sovereign bonds, what do you think are the main advantages to invest in green bonds? What are the incentives to issue green bonds?

G: Issuers are able to access a new set of bond investor when they issue green bonds. These investors may be more 'buy and hold' oriented than traditional investors. Issuers want to communicate their corporate environmental commitments. Asset managers want to own bonds from firms that are attune to climate change risks or trying to provide services that help cut emissions or build climate change resilience.

Me: Regarding Corporate bonds, what do you think are the main advantages to issuing a green bond? What are the incentives to buy a green bond?

G: Issuers are able to access a new set of bond investor when they issue green bonds. These investors may be more 'buy and hold' oriented than traditional investors. Issuers want to communicate their corporate environmental commitments. Asset managers want to own bonds from firms that are attune to climate change risks or trying to provide services that help cut emissions or build climate change resilience.

The main difference between sovereign and corporate issuers is that the public sector has an incentive to create public good while the private sector does not. So public sector/ government green bonds be more focussed on straight emission reduction projects or projects building climate change projects. Corporate green bonds will try to fund such projects but with more of a focus on projects that simultaneously make a profit; so, a heavy focus on energy efficiency projects which simultaneously cut CO2 emissions and reduce fuel bills.

Me: And for the investors, what are the advantages?

G: As above. Also, asset managers increasingly need to show they take ESG issues into account in order to win mandates to manage money on behalf of assets owners.

Me: Are there any negative aspects? Which?

G: The negatives would be if the bond performed poorly or the environmental projects that were meant to be funded by the bond were not funded by the bond. Analysis of a green bond may take more time and be more costly than for a non-green bond.

Me: At present, one can find statements in the literature to the effect that the yield of green bonds is higher than that of conventional bonds, while in others it is lower. Which position do you agree with?

G: We find that green bonds still tend to be issued in line with non-green bonds, but in the secondary market sometime to trade tight (ie with a higher price and a lower yield) compared too non-green bonds. But in some instances, in the developed market they demonstrate a little bit of a side in the second grade market. So, in other words, if I say a bond's trading inside the sector that means that – what does that mean? How can I explain that to you? It means that the price has risen. We tend to think that the company issuing the bond is not necessarily getting better pricing when they issue them. But in the second grade they tend to trade up a little bit. That's kind of an unusual that it expands eventually. If they are trading inside the second grade, that they would come to the market inside of the program. I suppose we have seen in our last report tentative evidence which is basically that you could get better pricing for green than non-green. Not so much because people they would firm was going to do better but more because there is more demand for green bonds than for non-green.

Me: How would you classify the risk of green bonds? (To answer this question, you can also compare the risk with conventional bonds)

G: The credit risk of a green bond is the same for a non-green bond from same entity as they rank pari passu. There is a risk the green project is not funded or the green element of the bond is criticised as insignificant.

Me: Although the green bond market has grown a lot it is still a relatively small part of the bond market. What do you think are the main challenges?

G: Private sector firms do not have many incentives to create public goods other than a carbon price and regulation. If we have a higher carbon price and more regulation, we will have more real economy green capex and probably then more green bonds. The public sector sometimes claims it does not have the money to fund climate change mitigation or adaptation projects.

Me: Do you believe that mandatory regulations for the issuance of green bonds and the definition of "green" would help the further development of the market?

G: Industrial firms that issued green bonds sometimes face criticism that their bond are not really green. If there was an EU taxonomy defining what really is green, then perhaps this might coax more industrial firms to issue green bonds. They would be able to use the EU green taxonomy as cover for issuance.

Me: What (Regulation, tax incentive or other tools) do you think must/could be improved in favour of the green bond market long-term?

G: If you offer incentives for firms to issue green bonds, you may see a rise in issuance of bonds that are not green being sold as green. So, if you are going to have incentives you need good standards on what is green. In this sense the green taxonomy might assist preventing fraud. A higher carbon price would incentivise further real economy green capex which may lead to more green bond issuance. I suppose what is happening now is that the Corporate Governance in the European Union would like to take control over green bond market which is risky because they may overregulate and crush the market, but the hope is that they won’t want to be blamed as the institution who killed the green bond market. So, I think all in all they probably should be able to take charge in the green bond market in the next 2-4 years and allow to continue to grow successfully. There’s probably going to be further innovations. I mean, everyone is trying to work out what the next few steps are. I think I already said that I am slightly nervous about the EU taxonomy, it could be overly prescriptive and could lead to two markets, i.e. the EU market with high standards and the rest of the world market which is more flexible. That’s a risk but I suppose that the other positive is that there are some industrial firms that are willing to issue green because they do, they are criticised by NGOs and so one and so forth. It might be that those players are actively encouraged by the Taxonomy because they could say: “look, the taxonomy has said on pages 89 to 107 that our bond in the sector, if we issued this way, is green." So, they could actually use Taxonomy as a so shield against criticism and possibly for commode issuance from sort of issuance shy sectors that we have at the moment which is basically industrial sector quite nervous by issuing. We get a lot of issuance from utilities, from new energies etc. But less from industrials. So, the taxonomy might help in that suspect.

Me: Do you think the risk of green washing can be mitigated in the future? If yes do you have something in mind about how?

G: The corporate governance of the green bond market is quite good currently. Currently there are some sanctions if green bonds do not perform as they should. If a bond has a Moody's green bond assessment, the bond can suffer a Moody's green bond assessment downgrade if the bond does not find green projects as it should. MSCI will eject bonds from the Barclays Bloomberg MSCI green bond index if MSCI decides that the bonds in the end do not turn out to be green. The EU taxonomy may assist. I don't think it's that large of a risk. Yeah, it is a risk but its not very common or prevalent. There are some functions of bonds if the money is not spent on green for example if the bond has a Moody's green bond assessment it would be downgraded if the money was not spent on green. MSCI could throw the bond out the MSCI Barcleys Bloomberg Green Bond Index. NGOs could be critical of the issue and so could self-side research at least on the buy side. So, there are some sort of functions the market is constantly looking for the authenticity of the green statements. Given it is the main thing everyone is looking for, it would be quite difficult for it to be a common feature. You know you're looking out for something that people don't want. So, either people are blind, or people are very clever or there is not much going on – it's probably the latter.

Me: From an issuer perspective, what needs to be done/changed to increase green bond supply?

G: Private sector firms do not have many incentives to create public goods other than a carbon price and regulation. If we have a higher carbon price and more regulation, we will have more real economy green capex and probably then more green bonds. The public sector sometimes claims it does not have the money to fund climate change mitigation or adaptation projects. Capital injections into the multi-laterals might allow them to fund more climate change mitigation and adaptation projects

Me: Currently there is more demand than supply in the green bond market, therefore green bonds are often oversubscribed. Do you think demand will stay as high, grow even more or emasculate?

G: Demand will remain high unless we see significant green wash. The rising impact of climate change damages may spur demand for more green bonds. Well technically we have not put a forecast of emission for next year or subsequent years. So, we do that normally, but we haven't done it yet. But as this is sort of background info, I suppose I would say the following: There are some institutional successes that are worldwide and there is limited progress elsewhere. I mean, progress that we have seen is carbon price or permit trading, I think it induces different geographies, but the price is low recently in Europe. But so, that's what is background. I think that is a good thing about green bond market, it's not perfect but its positive.

Me: How do you think does the future of Green bonds look like? Is there a future or wont there be a differentiation between green and conventional bonds five years from now? Do you think that in ten years time all bonds will be green?

G: We have not estimated green bond supply beyond the end of this year. I do think that the market will keep growing actually. People have been waiting for ten years for the market to sort of fall over or collapse but it hasn't yet. Corporate governance generally is quite good. ICMA has in a couple of markets done a brilliant job overly a very good job. It induces the English law, kind of bring more principles, which have been adapted pretty much globally. However, I do not think that every bond will be green in ten years time. Well, you only get all bonds green if every company is only funding green projects. So, it's not clear that companies will stop funding non-green projects, but it may become more noticeable when they do. They may possibly pay a higher price like they may pay higher cover taxes, but I think even in ten years people will still be allowed to fund non-green activities. So, in itself I don't think a green bond label creates new green investments. So, you may hear people arguing about additionality. I think that that's sort of red hearing. I don't think it creates additional projects or you're sort of assuming it's a carbon price if you demand that. I don't think the label in itself creates additional emission reduction. They can issue label against it, that's not going to happen, but it is legitimate, it is a signalling mechanism to get the buyer to lower the cost, for the buyer to root out bonds which funds green projects. So that's basically what the label does: lower the cost of bringing the buyer and seller together whereby the buyer wanted to buy to fund green projects, which is a game - a small game but it's worldwide. To get more green capex in the real economy you need something like regulation, you need higher carbon price. Climate change damages is always quite good because it incentivises people to invest in adaptation. So, I do think it's a positive tool but it's not when it's on its own sufficient. But I do worry when I hear people say, politicians say, that they do not need to do anything because we have a green bond market. That's sort of false interpretation of what the green bond market does. It's reflecting investing is all going to the green space and it requires other measures to promote those investments.

2.8 Interview H

Me: To what extent do you deal with green bonds?

H: I work in the Sustainable Bonds, Debt Capital Markets team at an international acting bank. We are involved in structuring green, social and sustainability bonds across corporates, financials, multilateral institutions and public sector issuers. As a part of structuring process, we help issuers prepare draft green/social/sustainability bond frameworks, help them get the external review on their framework, marketing of their green bond issuance, and also with future impact reporting. We engage with the SRI (socially responsible investments) focused investors in order to understand investors' expectations. We also support the development of industry standards. The bank I'm working for is a member of the Executive Committee (ExCom) of ICMA Green Bond Principles and Social Bond Principles. They are co-chairing the Transition Finance Working Group of the ICMA Green Bond Principles ExCom and are also a member of the ICMA Green Bond Principles Working Group on Sustainability-Linked Bonds.

Me: The green bond market has grown considerably. Why do you think that's the case?

H: The growth in green bond market has largely been demand-side driven, as there is continuously increasing demand from investors to invest in ESG / SRI labelled issuances. In that sense Green bonds give investors comfort and credibility with regards to the sustainability credentials of the issuer, as a Green Bond is not a standalone issuance but requires issuers to have a sustainability strategy in place and convince the market how its green bond issuance is aligned with its core operations. We see green bond issuances getting oversubscribed 2-3x and even more in certain cases, as supply is not able to keep with the increasing demand

Me: The green bond label also gives issuers access to investors who have not looked at them before but are now interested to, thus increasing their investor base

H: Another reason is that the continuous development of regulations in this market has provided additional comfort to the investors. Even though the ICMA GBP/SBP/SBG are not binding regulations, these have been updated year on year and issuers align their Frameworks with these standards as that is considered best practices in the market

Me: What do you think are the main growth drivers?

H: I would say the same as in question two.

Me: Regarding Sovereign bonds, what do you think are the main advantages to issue in green bonds? What are the incentives to issue green bonds?

H: One of the key advantages of issuing a sovereign green bond is to attract new investors. Another advantage is that it helps in pushing the green bonds domestically as potential issuers who haven't looked at green bonds before start looking into it

Me: Regarding Corporate bonds, what do you think are the main advantages to invest in green bonds? What are the incentives to issue green bonds?

H: Increased investor base as mentioned above leading to oversubscribed orderbooks. Potential pricing advantage - Some issuers see tighter pricing, or lower New Issue Premium at execution due to larger orderbooks /sticky investors. Lower volatility in the secondary market as the buyers of green bonds are mostly buy and hold investors. Gives issuers the opportunity to highlight their sustainability initiatives

Me: And for the investors, what are the advantages?

H: Investors have green / ESG mandates and green bonds are a way to fulfil those mandates. Gives investors the opportunity to invest in sustainable projects as they can see the sustainable impact of their investments and have comfort that a third party has reviewed the framework and knows that their money is being used in a transparent manner. Increased interest and pressure from their customers to invest in a socially and environmentally responsible way.

Me: Are there any negative aspects? Which?

H: Lack of liquidity since this is a small market, thus not easy to enter and exit positions compared to the conventional bonds. But a lot of the investors are buy and hold and thus are not impacted by this. Furthermore, the lack of uniform data makes it difficult to report on the combined impact of various green bond investments.

Me: At present, one can find statements in the literature to the effect that the yield of green bonds is higher than that of conventional bonds, while in others it is lower. Which position do you agree with?

H: We see green bond performing in line or better than conventional bonds from the same issuer. However, the market is not yet big enough to say with certainty that green bonds necessarily perform better

Me: How would you classify the risk of green bonds? (To answer this question, you can also compare the risk with conventional bonds)

H: Green bonds rank pari-passu with conventional bonds, so they carry the same credit risk. But they have an added reputational risk for the issuer if they fail to meet the requirements as defined in their green bond framework

Me: Although the green bond market has grown a lot it's still a relatively small part of the bond market. What do you think are the main challenges?

H: The key challenges are finding the eligible green assets, organizing the various departments internally and extra costs (for certain issuers) associated with the external review on the green bond framework.

Me: Do you believe that mandatory regulations for the issuance of green bonds and the definition of "green" would help the further development of the market?

H: Yes, the development of ICMA Green Bond Principles has been the key reason for the market's growth as it clearly set the definition for green and social project categories that are eligible and would be accepted by the market as 'green'. But there are still a lot of questions around certain assets which are green and may not fall under the project categories defined in the ICMA GBP as those are high level and do no dive into the specific activities.

Me: What (Regulation, tax incentive or other tools) do you think must/could be improved in favour of the green bond market long-term?

H: Subsidies to cover the costs of external review for Emerging Market issuers would help in growing this market in those countries. Expanding the market to reduce entry barriers for issuers from heavy sectors such as Aviation or Oil & Gas who have a strong ambition to transition their activities and are also working to develop new and efficient technologies. This could be done by defining activities that may fall under the 'Transition' label

Me: Do you think the risk of green washing can be mitigated in the future? If yes do you have something in mind about how?

H: Only a handful of issuers have been labelled as 'green washing' the market. The requirement of external review on the green bond framework mitigates that to a large extent. Additionally, issuers are aware of the added reputational risk with green washing. Having said that, a clear definition of what is 'green', what is 'transition' and what is 'brown' will help in mitigating any green washing

Me: From an issuer perspective, what needs to be done/changed to increase green bond supply?

H: Having a sustainability plan in place that is ambitious and leads to increase in green investments, as that would help them to be able to come to this market repeatedly

Me: Currently there is more demand than supply in the green bond market, therefore green bonds are often oversubscribed. Do you think demand will stay as high, grow even more or emasculate?

H: Even after the significant growth in last few years the green bond market is still a small fraction (<2%) of the global bond market. We expect the demand and supply both to continue to increase for the next few years, and the demand-supply gap to remain the same or slightly reduce as more issuances come to the market

Me: How do you think does the future of Green bonds look like? Is there a future or wont there be a differentiation between green and conventional bonds five years from now? Do you think that in ten years' time all bonds will be green?

H: The first impact that green bonds had on the market was it made all the market participants talk about and focus on the impact of climate change and how financial markets can and need to tackle it by directing the flow money into more greener and cleaner investments. As investors tend to look at green bond issuers as a whole in terms of their ESG risks management and not just stand alone at the green bond, it led to issuers developing / integrating their sustainability strategy across their business. One common them across most of the issuers was that this led to the involvement of their sustainability teams with various departments and how can they integrate sustainability across their operations. While we expect increased investment in green assets in the future, there are no future scenarios (2 degree or 1.5-degree scenarios) without fossil fuel in the energy mix by 2050. Thus, not all conventional bonds would become green bonds as money will still be going into those assets for various reasons.

Appendix 3: Interview Partners

Interviewpartner	Gender	Place of work	Role	Date	Type of Interview	Interview length
A	Female	Luxembourg	An employee of the stock exchange who works in the legal area of green bonds. In addition, the person has also been actively involved in the high-level working group as well as the EU technical expert team in the development of requirements for the EU taxonomy and Eu green bonds standards.	21.10.2019	Phone interview - recorded	50 Minutes
B	Female	Netherlands	An employee of a multinational banking and financial services corporation from the field of sustainable finance	25.10.2019	Phone interview - recorded	34 Minutes
C	Male	United States	An employee from the bonds credit rating business with specialization in green bonds and ESG	25.10.2019	Phone interview - recorded	27 Minutes
D	Male	United States	Selfemployed expert with 11 years of experience with green bonds	26.10.2019	Written reply	-
E	Male	Germany	Employee of a German direct bank that uses its customer deposits exclusively to finance ecological loan projects	30.10.2019	Phone interview - recorded	32 Minutes
F	Female	Germany	Employee of an international bank in a department specialized in green bonds as well as part of the EU technical expert team	01.11.2019	Written reply	-
G	Male	United Kingdom	Head of sustainable finance at an international bank	05.11.2019	Written reply and Phone interview recorded	14 Minutes
H	Male	United Kingdom	Employee in an international bank in the department of sustainable bonds	08.11.2019	Written reply and Phone interview recorded	13 Minutes

Appendix 4: Coding Results

		Codes				
Category	Growth barriers	Additional costs (Persons B, C, D, E, F, G and H)	Lack of project diversity and availability (Persons B, C and F)	Lack of clear definition of "green"; Market uncertainities; Greenwashing risk (Persons A, C, E; Persons B, D, F, G and H: Greenwashing risk overestimated)	Issue of additionality (Persons B and G)	Financial barriers - Investor perspective (Persons B, C, E and F)
	Opportunities and advantages	Fulfilling international commitments (Persons A, B, C and F)	Reputation/Pressure from outside/ change of mindset (Persons A, B, C, D, E, F, G and H)	Transparency (Persons A, B, C, D, E, F and H)	Attracting new and diversified investor base (Persons B, D, E, G and H)	Financial/ Pricing advantages- Issuer perspective (Persons B, C, E and F)
	Tools and regulations	Financial Support (Persons B, D, G and H)	Regulations (EU taxonomy, EU green bond standard) (Persons A, B, C, D, E, F, G and H)	Scaling up (Person A and E)	Tax incentives (Persons A, B and C)	
	Future prognosis	Demand will increase (Persons A, B, C, D, E, F, G and H)	Supply will increase (Persons D, E and H)	Potential of becoming mainstream (Persons A, D, F; Persons C and E: Potential but depends on time frames)	Not predictable (Persons B, G and H)	